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AN ATLAS

OF

HUMAN ANATOMY

FOR STUDENTS AND PHYSICIANS

BY

CARL TOLDT, M.D.

ASSISTED BY

PROFESSOR ALOIS DALLA ROSA, M.D.

Adapted to English and American and International Terminology

BY

M. EDEN PAUL, M.D. Brux., M.R.C.S., L.R.C.P.

FOURTH SECTION

E. SPLANCHNOLOGY

(FIGURES 641 TO 932 AND INDEX)

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SPLANCHNOLOGIA

SPLANCHNOLOGY

SPLANCHNOLOGY—GENERAL CONSIDERATIONS

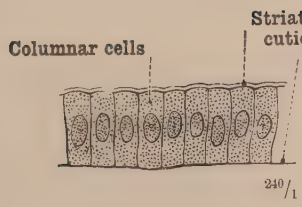


FIG. 641.—COLUMNAR, OR CYLINDER, EPITHELIUM.

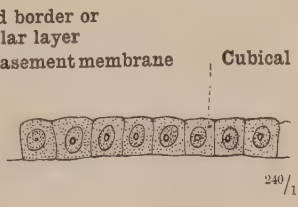


FIG. 642.—CUBICAL EPITHELIUM.

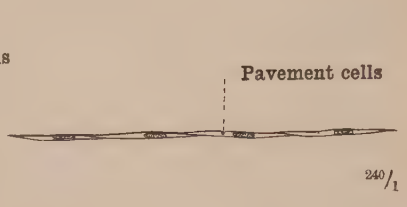


FIG. 643.—PAVEMENT EPITHELIUM.

SIMPLE EPITHELIUM[1] IN VERTICAL SECTION.

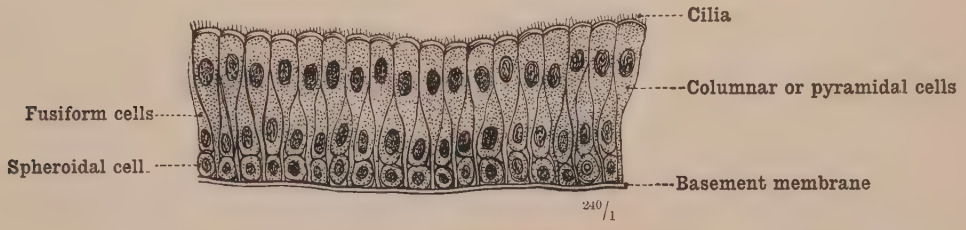


FIG. 644.—TRANSITIONAL[1] COLUMNAR CILIATED EPITHELIUM IN VERTICAL SECTION.

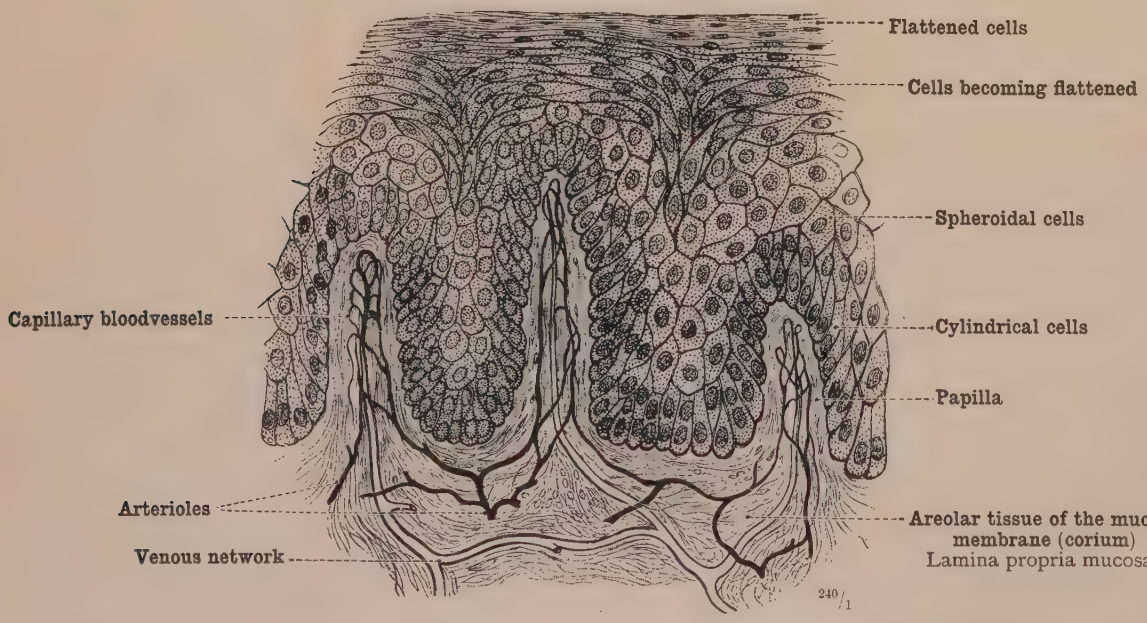


FIG. 645.—STRATIFIED EPITHELIUM[1] IN VERTICAL SECTION (MUCOUS MEMBRANE OF THE LOWER LIP).

The bloodvessels of the mucous membrane have been artificially injected.

[1] *Classification of Epithelia.*—An epithelium consisting of a single layer of cells is called a *simple* epithelium, in contradistinction to a *stratified* epithelium, which consists of numerous layers of cells. Where two or three layers of cells only are found, the cells nearer the basement membrane being usually smaller, and dovetailed among the bases of the superficial cells, the epithelium is called *transitional.* Transitional and stratified epithelium are grouped together as *compound* epithelia.—TR.

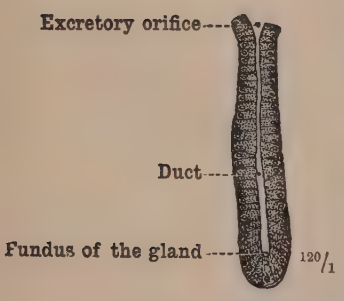


FIG. 646.—SIMPLE TUBULAR GLAND.

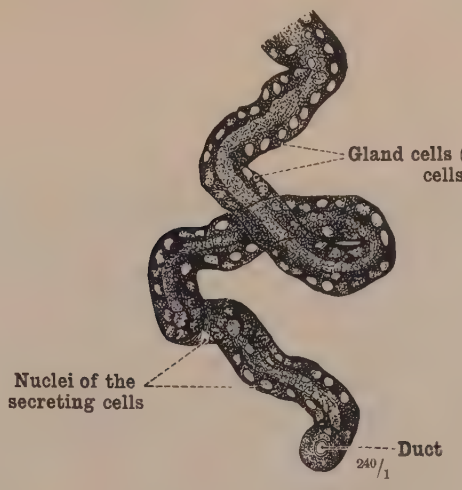


FIG. 647.—CONVOLUTED TUBULAR GLAND.

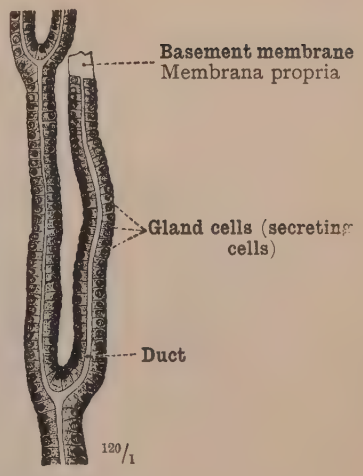


FIG. 648.—BRANCHED TUBULAR GLAND.

GLANDULÆ TUBULOSÆ—TUBULAR GLANDS.

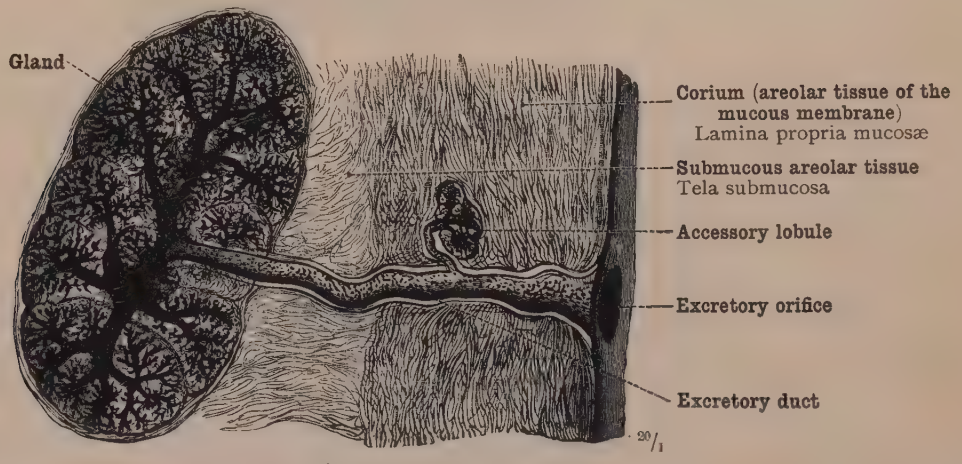


FIG. 649.—RACEMOSE OR ACINOUS GLAND (GLANDULA ALVEOLARIS SIMPLEX[1]), THE DUCTS OF WHICH HAVE BEEN INJECTED (LABIAL GLAND).

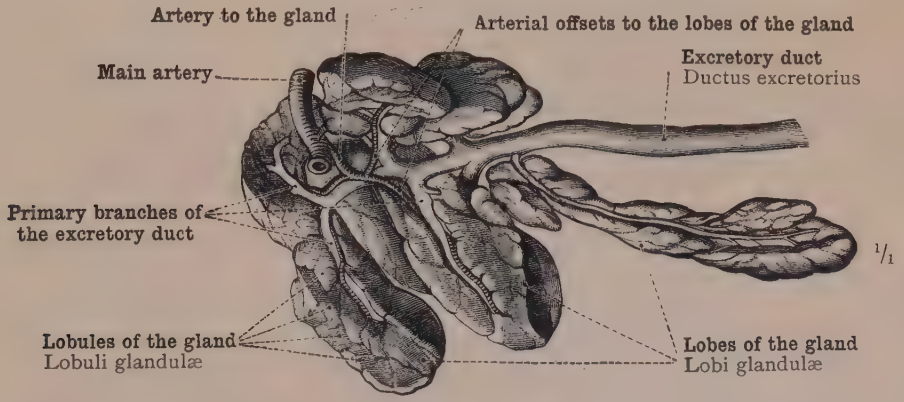


FIG. 650.—RACEMOSE OR ACINOUS GLAND (GLANDULA ALVEOLARIS COMPOSITA[1]), THE LOBES OF WHICH HAVE BEEN ARTIFICIALLY ISOLATED AND DRAWN APART (THE SUBMAXILLARY GLAND).

[1] Though the labial gland shown in Fig. 649 is called by the author glandula alveolaria *simplex*, and the submaxillary gland shown in Fig. 650 glandula alveolaria *composita*, both are *compound glands* according to the English terminology, in which a gland is regarded as *simple* only when it consists of a single, unbranched cavity, tubular or saccular, as the case may be.—TR.

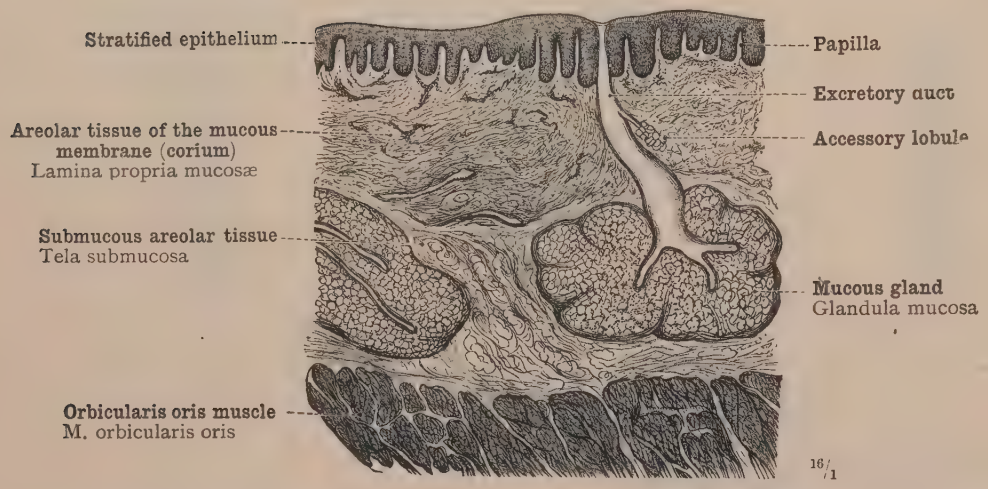


FIG. 651.—MUCOUS MEMBRANE, WITH PAPILLÆ, STRATIFIED EPITHELIUM, AND RACEMOSE GLANDS, IN VERTICAL SECTION (MUCOUS MEMBRANE OF THE LOWER LIP).

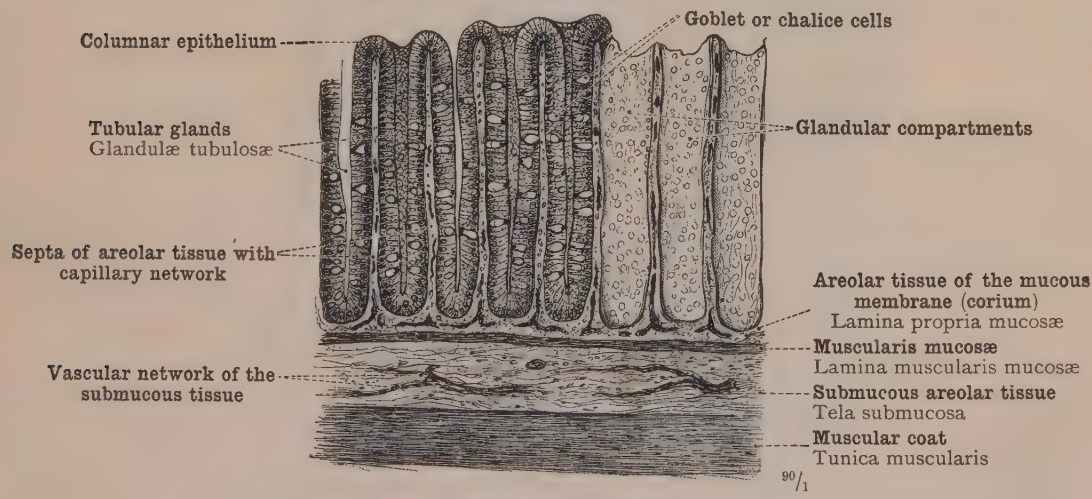


FIG. 652.—MUCOUS MEMBRANE WITH COLUMNAR EPITHELIUM AND TUBULAR GLANDS IN VERTICAL SECTION (MUCOUS MEMBRANE OF THE LARGE INTESTINE).

On the right side of the preparation three of the glands have fallen out, bringing into view the areolar tissue of the mucous membrane (corium) with its compartments for the glands.

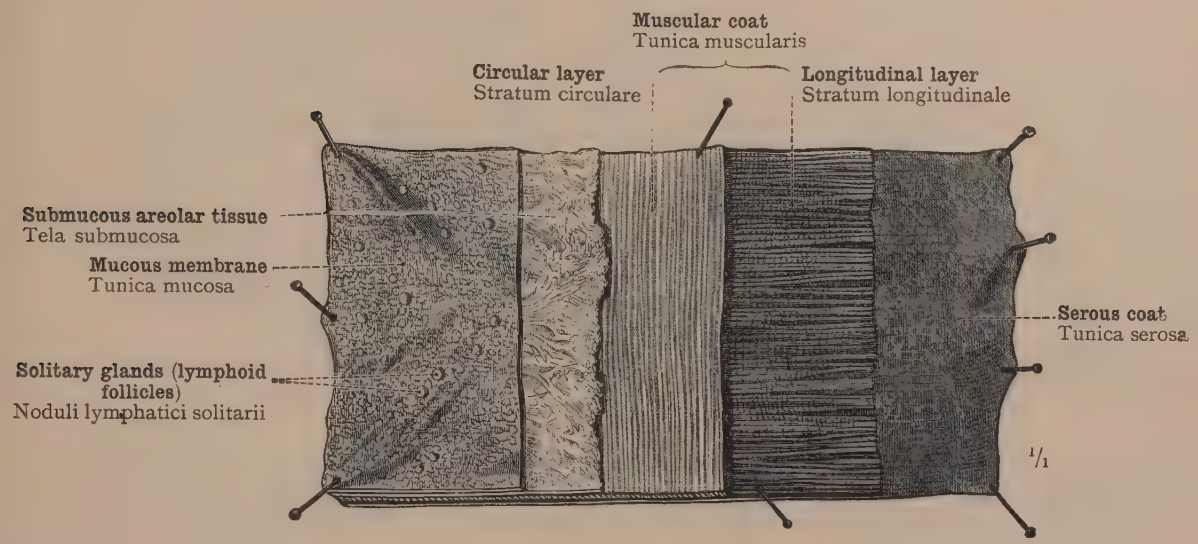


FIG. 653.—THE LAYERS OF THE INTESTINAL WALL SHOWN BY THE REMOVAL OF THE SUCCESSIVE COATS IN A PORTION STRETCHED OUT FLAT.

FIG. 654.—VERTICAL SECTION THROUGH THE WALL OF THE SMALL INTESTINE (INTESTINUM ILEUM) IN THE DIRECTION OF ITS LENGTH. NODULUS LYMPHATICUS SOLITARIUS, SOLITARY GLAND (LYMPHOID FOLLICLE). GLANDULÆ INTESTINALES (LIEBERKUEHNI), CRYPTS OR FOLLICLES OF LIEBERKÜHN (LIEBERKÜHN'S GLANDS).

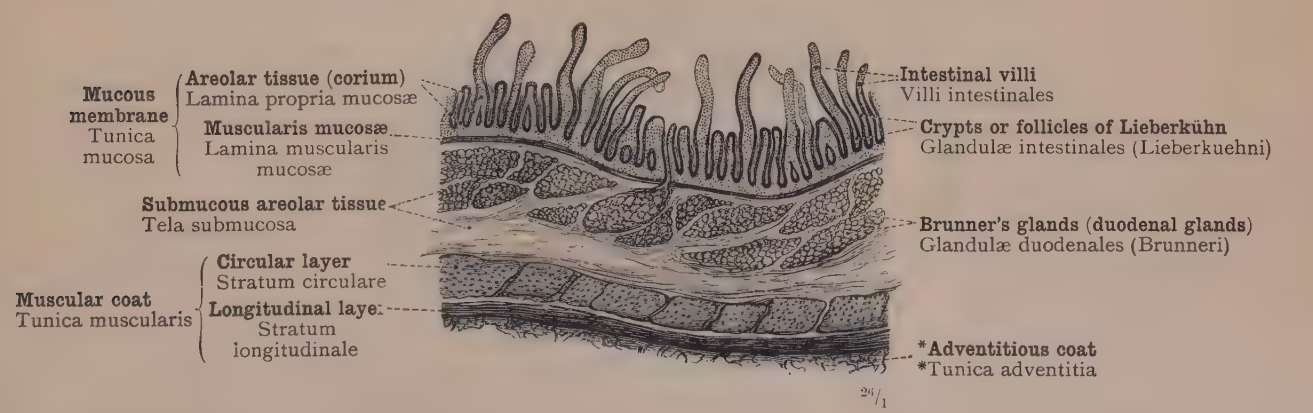


FIG. 655.—VERTICAL SECTION THROUGH THE WALL OF THE DUODENUM IN THE DIRECTION OF ITS LENGTH. GLANDULÆ DUODENALES (BRUNNERI), BRUNNER'S GLANDS (DUODENAL GLANDS).

The Layers of the Intestinal Wall.

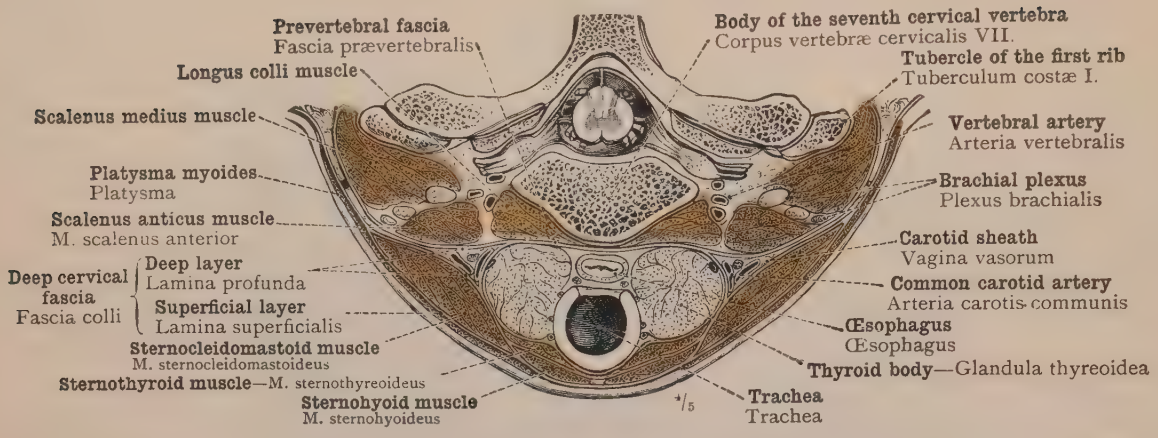


FIG. 656.—VISCUS, THE OUTER SURFACE OF WHICH IS THROUGHOUT CONNECTED WITH THE WALL OF THE BODY-CAVITY (CŒLOM) BY MEANS OF AREOLAR TISSUE. HORIZONTAL SECTION THROUGH THE LOWER PART OF THE NECK. SEMI-DIAGRAMMATIC.

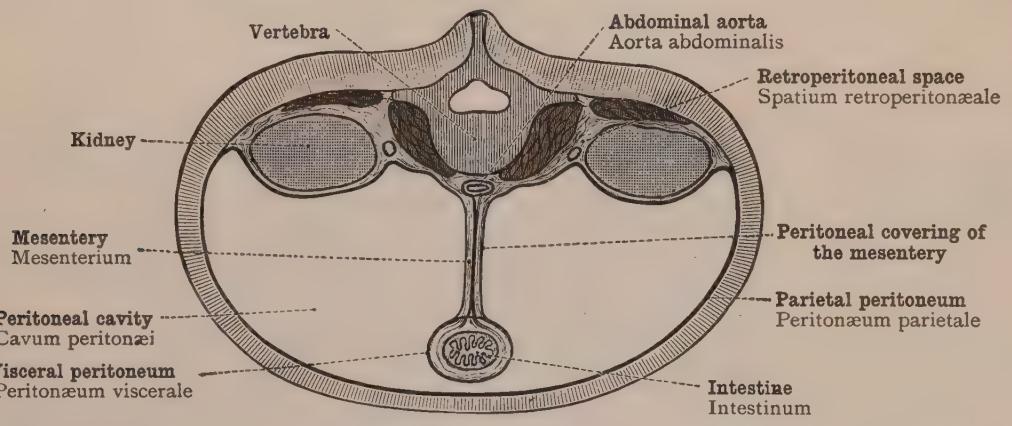


FIG. 657.—PORTION OF INTESTINE, FREELY MOBILE, THE OUTER SURFACE HAVING A SEROUS INVESTMENT (TUNICA SEROSA). CONNECTED WITH THE WALL OF THE BODY-CAVITY (CŒLOM) BY MEANS OF A FREE MESENTERY. PARIETAL AND VISCERAL LAYERS OF THE PERITONEUM. DIAGRAMMATIC.

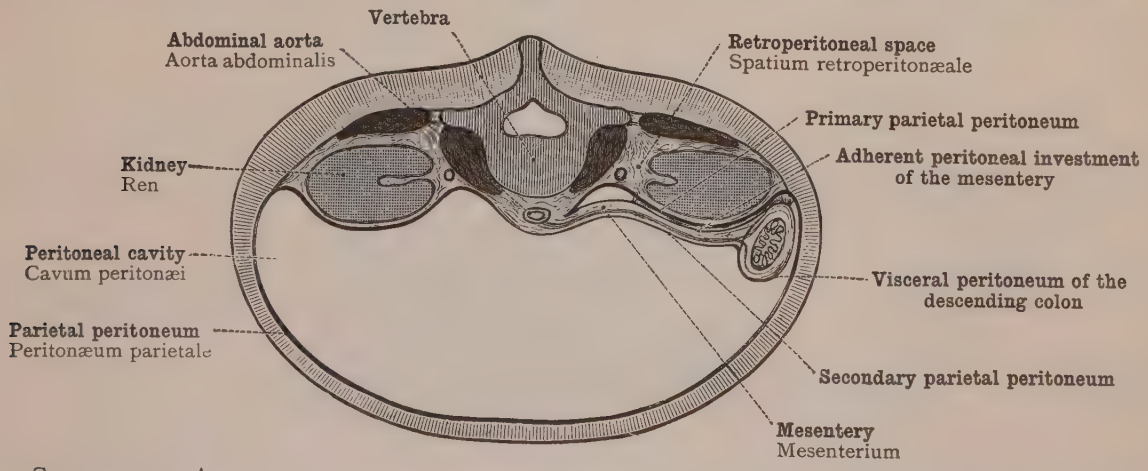


FIG. 658.—SECONDARY ADHESION TO THE BODY-WALL OF A PORTION OF INTESTINE, ORIGINALLY FREELY MOBILE. PRIMARY AND SECONDARY PARIETAL PERITONEUM. DIAGRAMMATIC.

Relations of the Viscera to the Body-Wall.

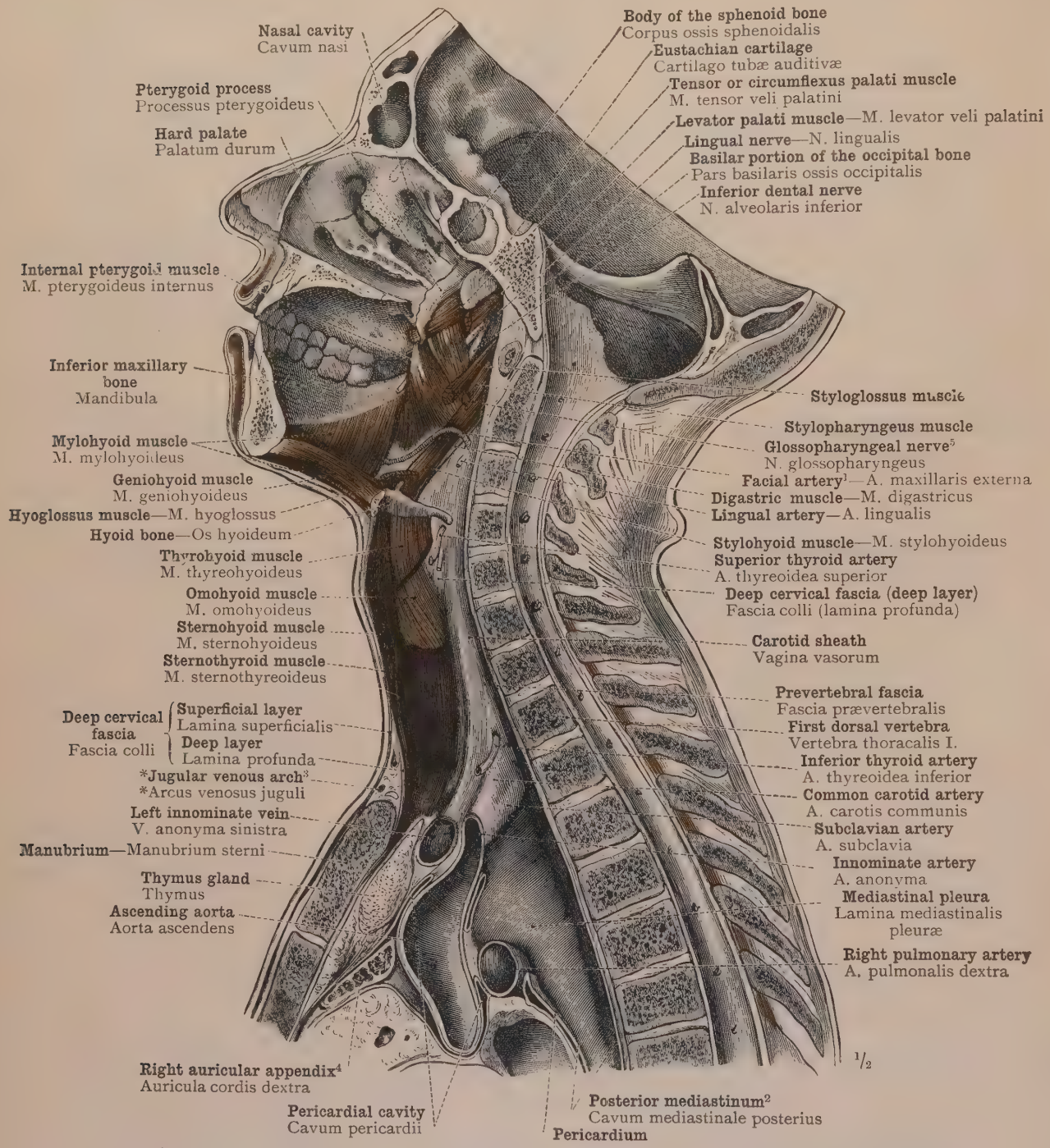
APPARATUS DIGESTORIUS

THE ORGANS OF DIGESTION

CEPHALIC AND CERVICAL PORTIONS

OF THE

DIGESTIVE ORGANS



[1] *Facial Artery.*—Quain gives *external maxillary* and Macalister *external mandibular* as an alternative name for this artery, but it is so rarely in England called anything but the *facial* artery, that I have not thought it necessary to mention these synonyms in the text.—Tr.

[2] *Mediastinum.*—The word *mediastinum* (*per medium tensum*, "stretched through the middle") properly denotes the bilaminar median partition between the right and left pleural cavities; the space between these layers, *cavum mediastinale*, should, strictly, be spoken of as the *mediastinal cavity* or *space*. In England, however, it is customary, when speaking of the various divisions of this cavity, to call them, by metonymy, simply *anterior mediastinum*, *middle mediastinum*, *posterior mediastinum*, and *superior mediastinum*.—Tr.

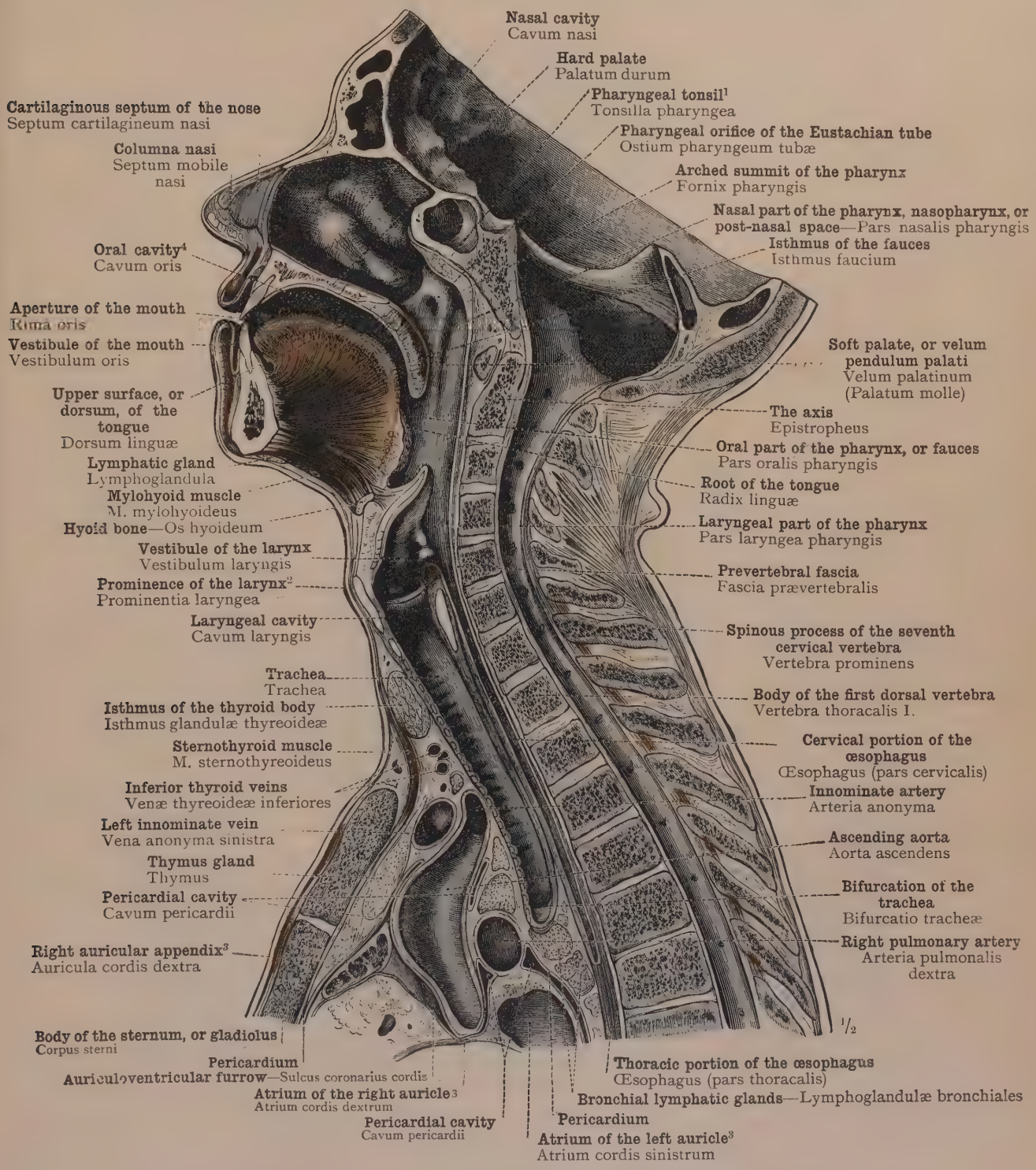
[3] *Jugular Venous Arch.*—This term is not used by English anatomists. It is applied by Toldt to the communicating branch in the suprasternal space (*spatium interaponeuroticum suprasternale*, or Burns's space) between the two anterior jugular veins, and to those portions of the anterior jugular veins below the communicating branch, which run outwards on each side behind the origin of the sterno-cleidomastoid muscle to open into the lower end of the external jugular vein. A transverse venous arch is thus formed at the root of the neck between the external jugular veins.—Tr.

[4] See note 3 to p. 411.

[5] Or *ninth cranial nerve.*

FIG. 659.—VISCERAL CAVITY (CŒLOM) OF THE HEAD AND NECK, AND ITS CONNEXION WITH THE VISCERAL CAVITY (CŒLOM) OF THE THORAX, IN MEDIAN SAGITTAL SECTION. FROM A WELL-HARDENED BODY, DIVIDED SAGITTALLY IN THE MEDIAN PLANE, WITH THE VISCERA REMOVED. RIGHT SIDE.

Cavum viscerale capitis et colli—Visceral cavity (cœlom) of the head and neck.



[1] Known also as *Luschka's gland* or *Luschka's tonsil* (third tonsil). This combines with the *tonsils proper* (amygdalæ, tonsillæ palatinæ) and the *lingual tonsil* (fourth tonsil, see note 4 to p. 416) to form a ring of lymphoid tissue round the commencement of the fauces, the continuity of which in the earlier stages of development is almost unbroken. It has been called by Waldeyer the *lymphoid faucial ring*.—Tr.

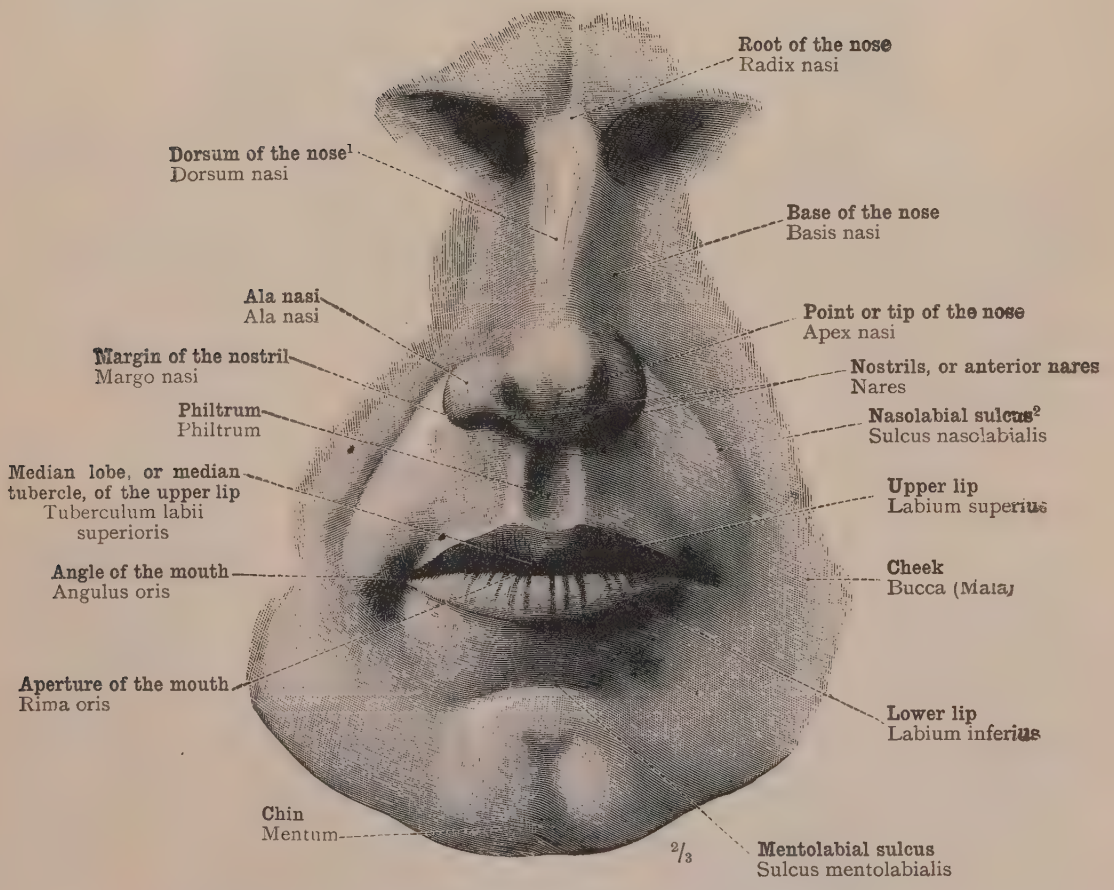
[2] Or *pomum Adami*.

[3] On the Continent, the signification of the term *auricula* is restricted to its proper and primitive meaning, denoting what in England is usually called the *auricular appendix*; whilst the main cavity, in England usually misnamed *auricle*, is by the author called *atrium*. As the name *auricle* was originally given to the *appendix* owing to its resemblance in shape to the triangular external ear with pointed tip of many animals, it is obvious that the Continental usage is to be preferred.—Tr.

[4] See note 3 to p. 414.

FIG. 660.—CEPHALIC AND CERVICAL VISCERA, AND THEIR PASSAGE INTO THE THORACIC CAVITY, IN MEDIAN SAGITTAL SECTION.

Viscera capitis et colli—Cephalic and cervical viscera.



[1] The upper or bony part of the dorsum of the nose is often spoken of as the *bridge*.—Tr.
[2] At its upper extremity the nasolabial sulcus is continued on to the side of the nose, above the ala, and is here termed the *alar sulcus*.—Tr.

FIG. 661.—PARTS OF THE FACE HAVING RELATION TO THE VISCERA. FROM THE PHOTOGRAPH OF A YOUNG MAN.

Facies—The face.

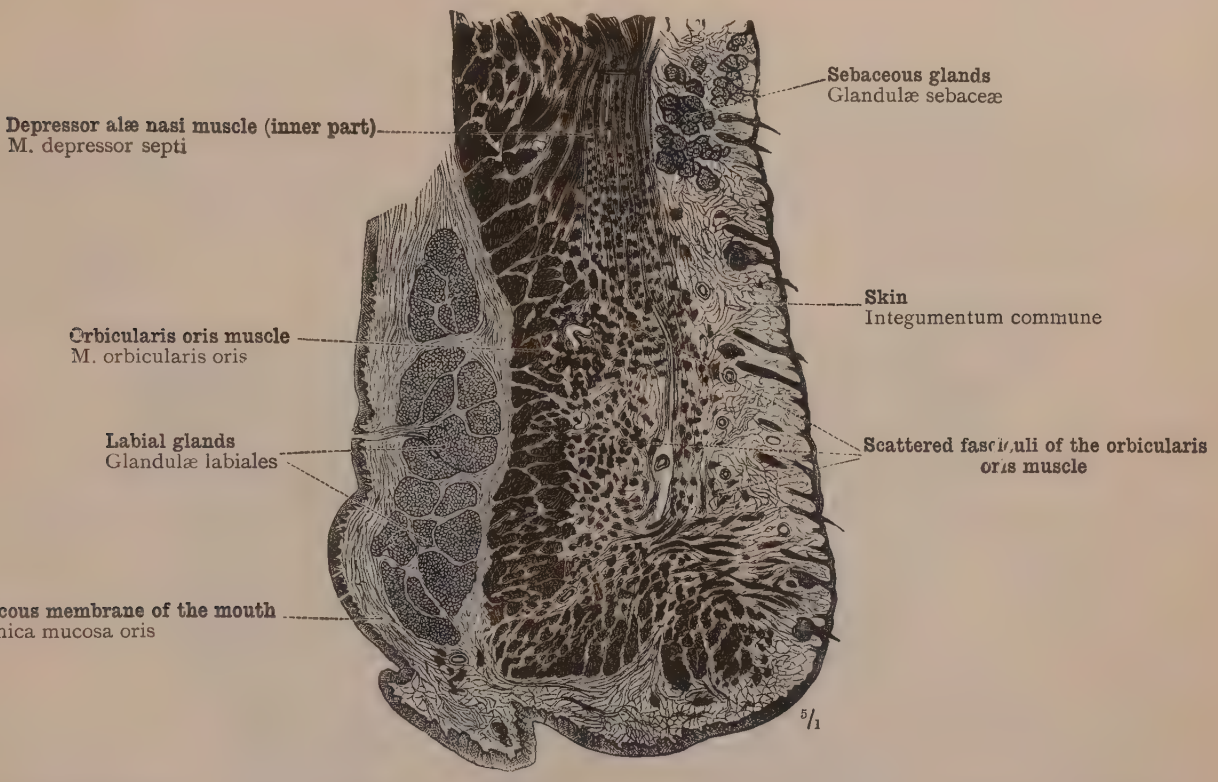
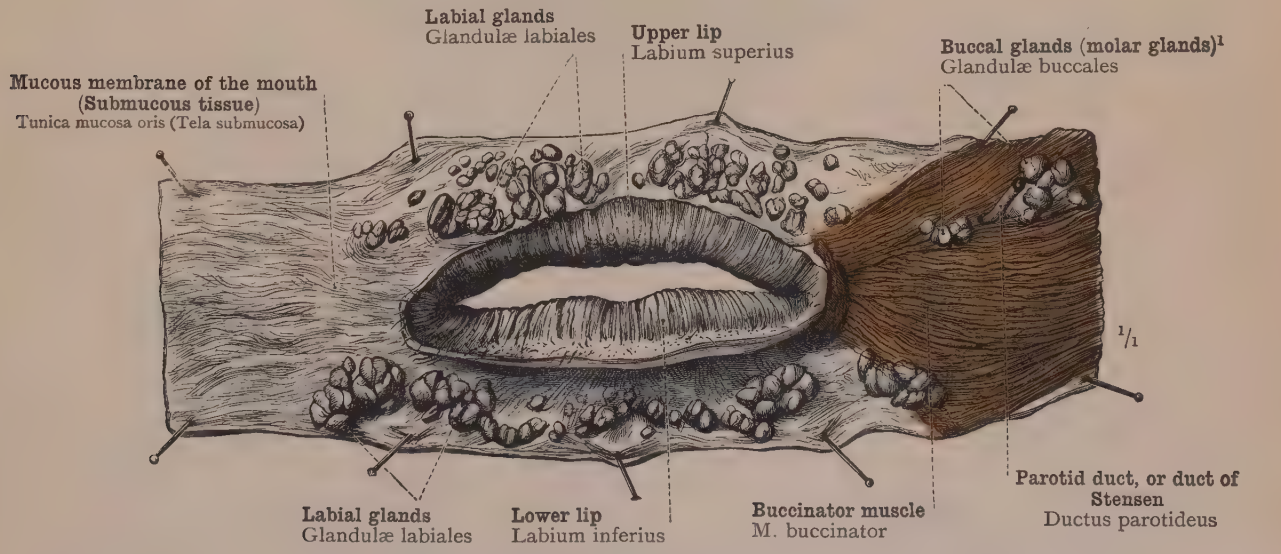


FIG. 662.—SAGITTAL SECTION THROUGH THE MIDDLE OF THE UPPER LIP, SHOWING ITS LAYERS, AND THE TRANSITION OF THE SKIN INTO THE MUCOUS MEMBRANE OF THE MOUTH.

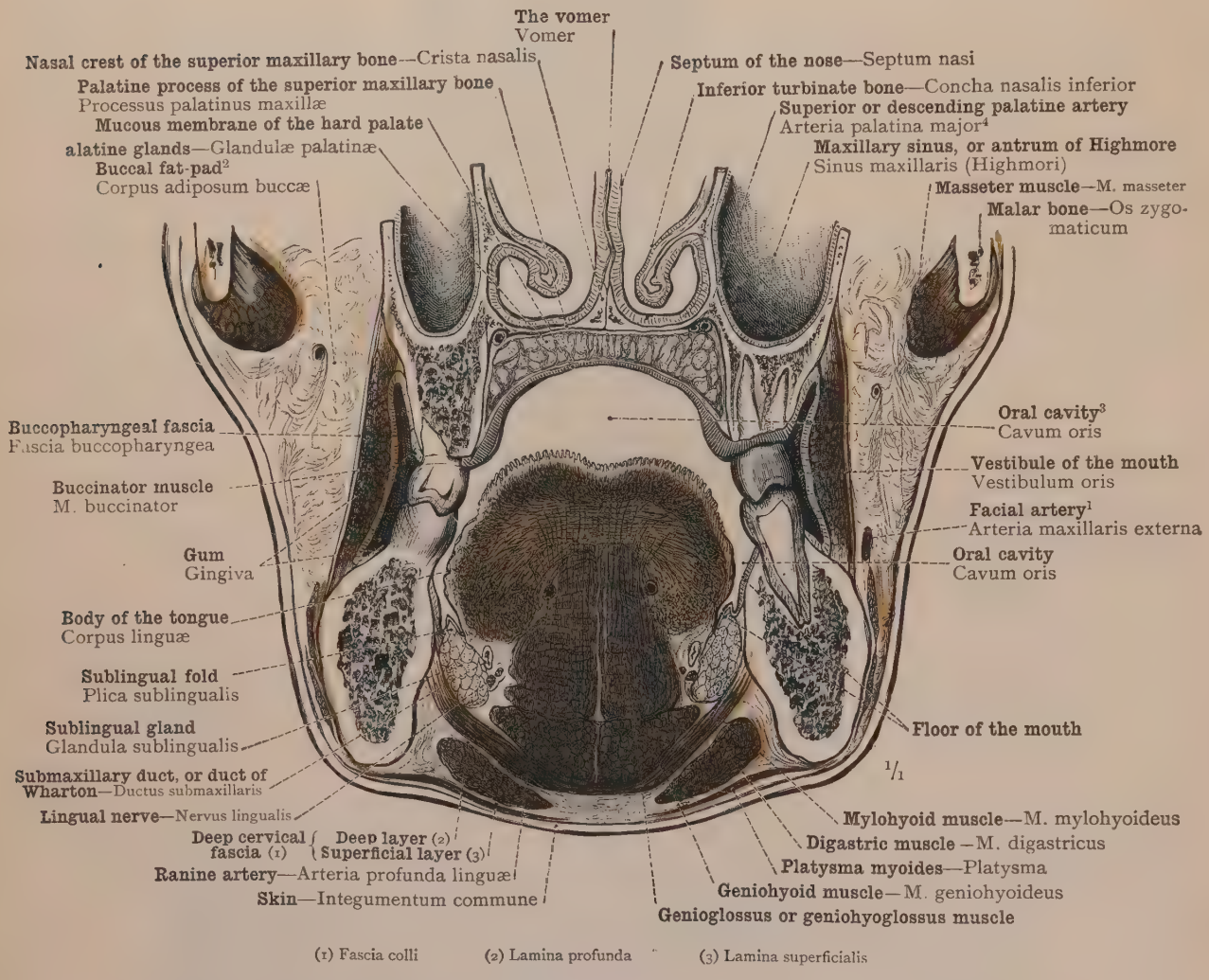


[1] Some of the *buccal glands* lie between the buccinator muscle and the mucous membrane and the cheek. Those here figured, however, larger than the rest, are between the buccinator and masseter muscles. They open by separate ducts near the last molar tooth, and are distinguished as *molar glands*.—TR.

FIG. 663.—MUCOUS GLANDS OF THE LIPS AND THE CHEEKS, LABIAL AND BUCCAL (MOLAR) GLANDS, LAID BARE BY THE REMOVAL OF THE SKIN, THE ORBICULARIS ORIS, AND THE ADJACENT MUSCLES. THE MUCOUS MEMBRANE IS SEEN FROM BEFORE.

On the left side the buccinator muscle has not been removed.

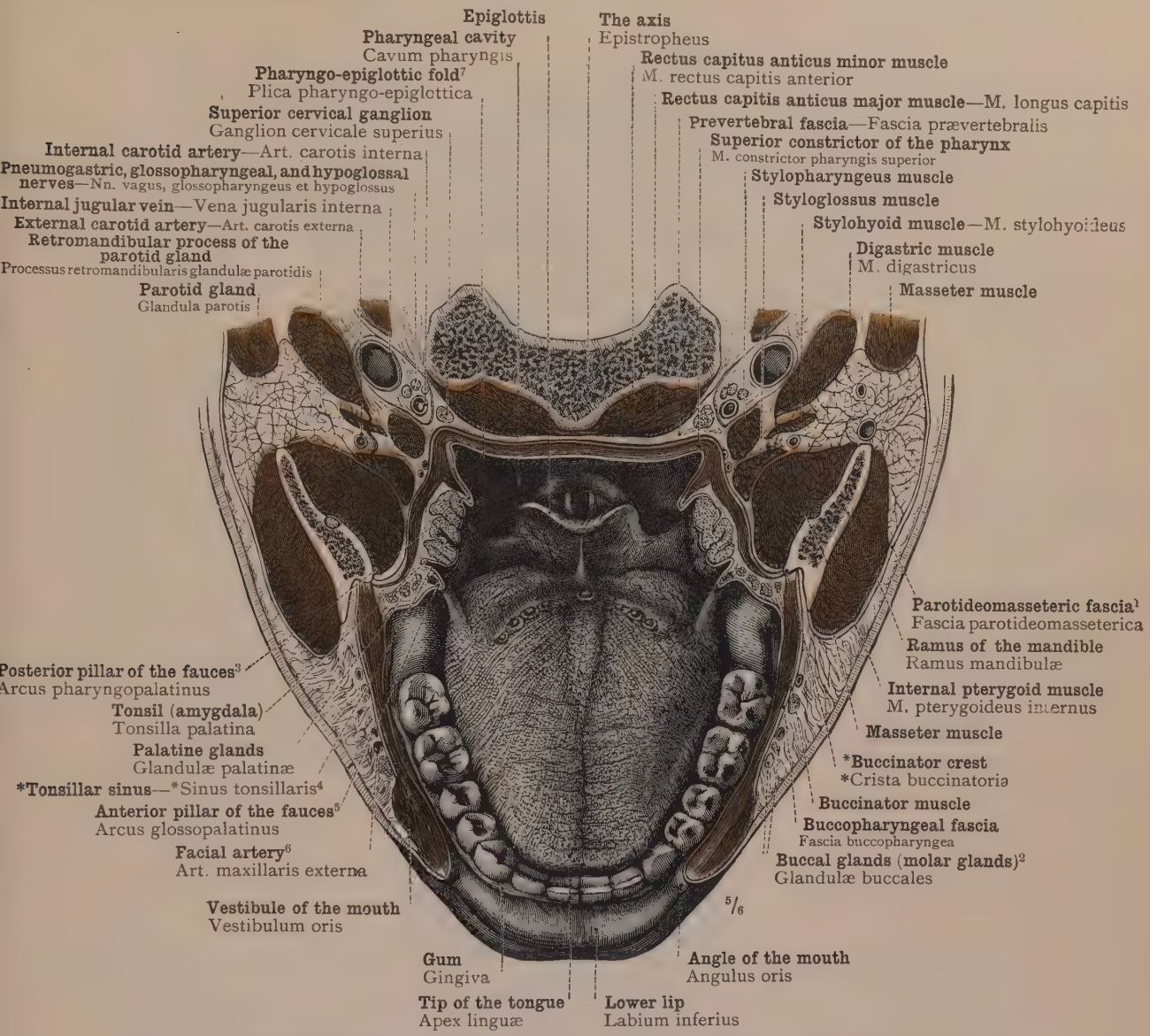
Labia oris—The lips.



[1] See note [1] to p. 410.
[2] Sometimes, but inappropriately, named the *sucking-pad*.—Tr.
[3] A large cavity, such as is here represented, does not usually exist in the mouth. Normally when the mouth is closed the dorsum of the tongue is almost in apposition with the palate, being separated from it only by a narrow slit.—Tr.
[4] *Arteria Palatina Major*.—This name is given by the author to the *superior* or *descending palatine artery, arteria palatina descendens*, after its emergence on to the inferior surface of the hard palate.—Tr.

FIG. 664.—CORONAL SECTION THROUGH THE FACE BETWEEN THE FIRST AND SECOND MOLAR TEETH. WALLS OF THE ORAL CAVITY: UPPER WALL, OR ROOF OF THE MOUTH, CONSISTING OF THE HARD PALATE, PALATUM DURUM; LOWER WALL, OR FLOOR OF THE MOUTH, WITH THE SUBLINGUAL GLAND; LATERAL WALLS OF THE MOUTH, FORMED BY THE MUCOUS MEMBRANE OF THE CHEEKS. CAVUM ORIS, ORAL CAVITY, THE INTERIOR OF THE MOUTH (*see note* [3] *above*); VESTIBULUM ORIS, THE VESTIBULE OF THE MOUTH. THE DIAPHRAGMA ORIS, FORMED BY THE TWO MYLOHYOID MUSCLES AND STRENGTHENED BY THE TWO GENIOHYOID MUSCLES. SEEN FROM BEFORE.

Cavum oris—The oral cavity.



[1] In England the portion of the deep cervical fascia covering the parotid gland is usually distinguished as the *parotid fascia;* that covering the masseter muscle, as the *masseteric fascia.*—Tr.

[2] See note [1] to p. 413.

[3] Also known as the *posterior palatine*, or *pharyngopalatine, arch.*

[4] *Sinus Tonsillaris.*—"The tonsil, in the fœtus, develops in a depression between the pillars of the fauces, called the *tonsillar sinus. As a rule this depression is not completely filled by the tonsil when that organ has attained its full size, and there usually remains above the tonsil a triangular hollow, the *supratonsillar fossa*, which persists throughout adult life. In front of and behind the tonsil the pillars of the fauces may either remain distinct, with a groove of variable depth, the remains of the *tonsillar sinus*, between them and the tonsil; or else the tonsil may become united with one or both the pillars, in which case a portion of the latter, becoming converted into lymphoid tissue, comes to form an actual constituent part of the tonsil."—Von Langer and Toldt's "Anatomy," 7th ed., p. 300. (Fig. 671, p. 418, shows such an adhesion between the tonsil and the posterior pillar of the fauces).—Tr.

[5] Known also as the *anterior palatine*, or *glossopalatine, arch.*

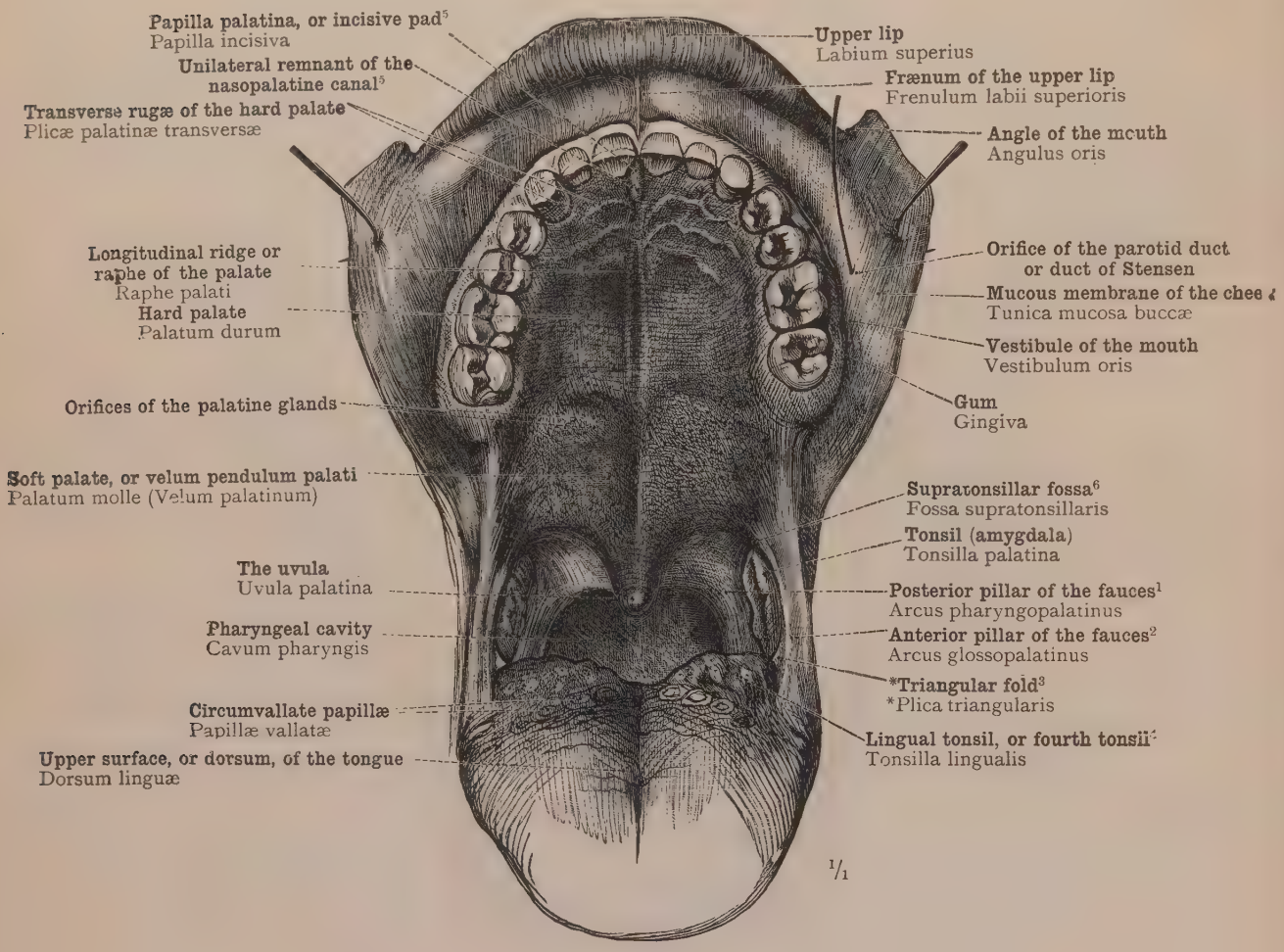
[6] See note [1] to p. 410.

[7] *Plica Pharyngo-epiglottica.*—Three folds of mucous membrane pass from each side of the epiglottis to adjacent structures. The *lateral glosso-epiglottic fold* (Fig. 673, p. 419 and Fig. 778, p. 461) passes forwards to the side of the tongue; the *aryteno-epiglottic fold* (Fig. 778, p. 461) passes backwards and inwards to the epiglottis; and the *pharyngo-epiglottic fold*, between these, passes outwards to the lateral wall of the pharynx. It forms the boundary between the oral and the laryngeal part of the pharynx. Beneath the mucous membrane is a thin strand of fibrous tissue, connecting the side of the epiglottis with the lower border of the Eustachian cartilage. This is the *pharyngo-epiglottic ligament.*—Tr.

FIG. 665.—LOWER WALL OF THE ORAL CAVITY, OR FLOOR OF THE MOUTH, WITH THE TONGUE AND THE LOWER LIP, AND THE MIDDLE OR ORAL PORTION OF THE PHARYNX (FAUCES), SEEN FROM ABOVE.

The cheeks, the tonsils with the palatine arches (pillars of the fauces), and the lateral and posterior walls of the pharynx, have been divided horizontally, likewise the rami of the mandible with the muscles attached thereto, and the parotid glands.

Cavum oris—The oral cavity.



1 Also known as the *posterior palatine*, or *pharyngopalatine*, *arch.*

2 Also known as the *anterior palatine*, or *glossopalatine*, *arch.*

3 **Triangular Fold.*—This is included between the two limbs into which the anterior pillar of the fauces divides as it approaches the side of the tongue. It should be noted that the name *plica triangularis* has been applied to another fold of mucous membrane, viz., to that covering the *fossa supratonsillaris*.—Tr.

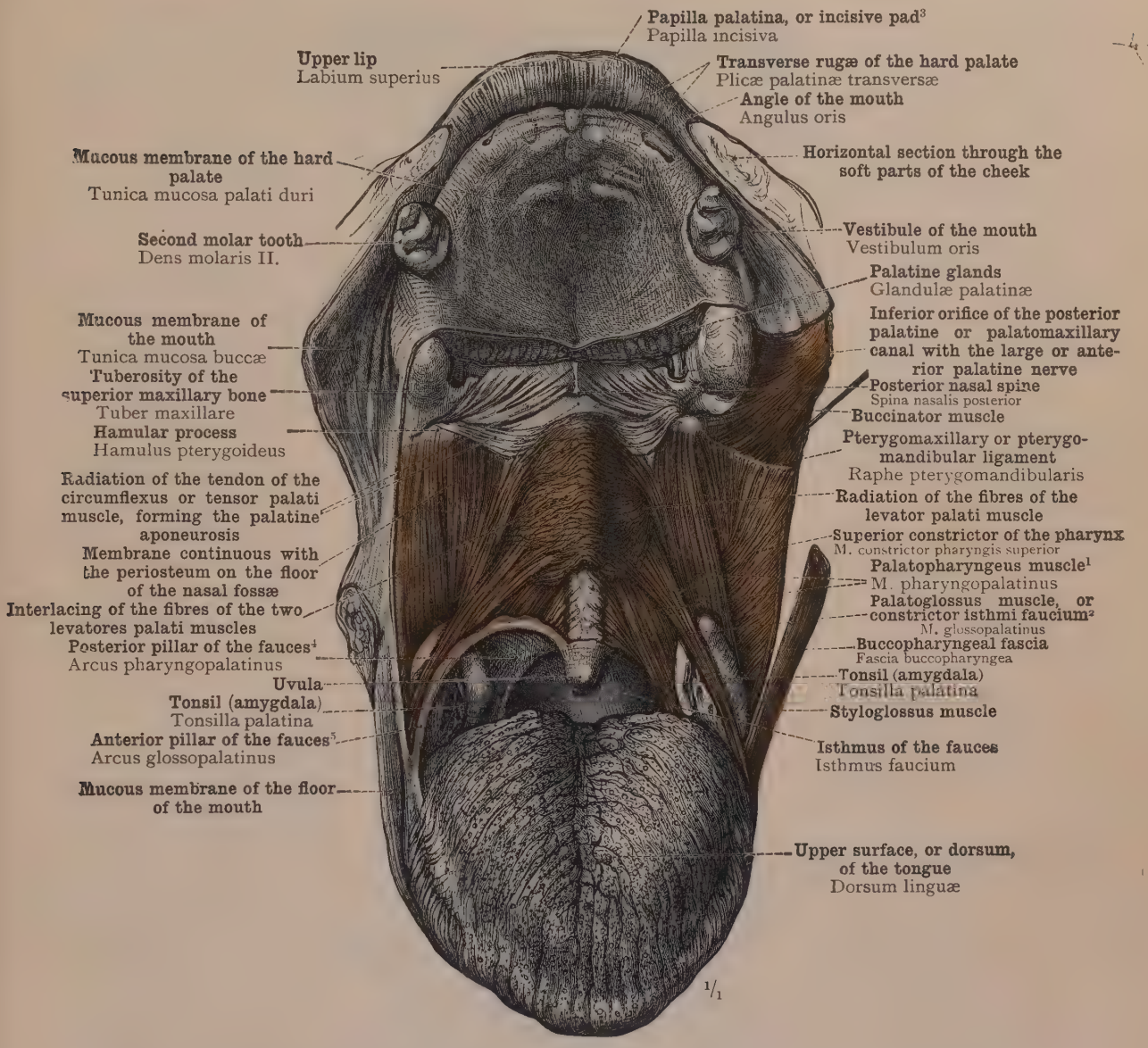
4 *Lingual Tonsil.*—This name is sometimes given to the group of lymphoid follicles found on each side of the dorsum of the tongue at its base, behind the row of circumvallate papillæ. See also note 1 to p. 411.—Tr.

5 On the *papilla palatina* or *incisive pad* may be found on one or both sides a blind recess, constituting the remnant of the canal which in many animals in this situation leads from the mouth to the nose, and known variously as the *incisor canal*, *nasopalatine canal*, *canal of Stensen*, or *ductus incisivus*. In man this canal is usually represented by a strand of connective tissue which runs from the recess in the incisive pad upwards through the incisor or anterior palatine canal (canal of Stensen) of the superior maxillary bone to the floor of the nasal fossæ.—Tr.

6 See note 4 to p. 415.

FIG. 666.—UPPER WALL OF THE ORAL CAVITY, OR ROOF OF THE MOUTH, WITH THE UPPER LIP, AND THE PASSAGE (ISTHMUS FAUCIUM) FROM THE MOUTH INTO THE ORAL PORTION OF THE PHARYNX (THE FAUCES). PALATUM DURUM, THE HARD PALATE; PALATUM MOLLE, THE SOFT PALATE, OR VELUM PENDULUM PALATI, WITH THE UVULA; ARCUS GLOSSOPALATINUS, THE ANTERIOR PILLAR OF THE FAUCES, KNOWN ALSO AS THE ANTERIOR PALATINE OR GLOSSOPALATINE ARCH; ARCUS PHARYNGOPALATINUS, THE POSTERIOR PILLAR OF THE FAUCES, KNOWN ALSO AS THE POSTERIOR PALATINE OR PHARYNGOPALATINE ARCH; TONSILLA PALATINA, THE TONSIL (AMYGDALA).

After the removal of the lower jawbone, the palate was placed in an almost vertical position, and the tongue drawn downwards as far as possible; hence the anterior pillar of the fauces is much stretched.


Papilla palatina, or incisive pad[3]
Papilla incisiva
Upper lip
Labium superius
Transverse rugæ of the hard palate
Plicæ palatinæ transversæ
Angle of the mouth
Angulus oris
Mucous membrane of the hard palate
Tunica mucosa palati duri
Horizontal section through the soft parts of the cheek
Second molar tooth
Dens molaris II.
Vestibule of the mouth
Vestibulum oris
Palatine glands
Glandulæ palatinæ
Mucous membrane of the mouth
Tunica mucosa buccæ
Inferior orifice of the posterior palatine or palatomaxillary canal with the large or anterior palatine nerve
Tuberosity of the superior maxillary bone
Tuber maxillare
Posterior nasal spine
Spina nasalis posterior
Buccinator muscle
Hamular process
Hamulus pterygoideus
Pterygomaxillary or pterygomandibular ligament
Raphe pterygomandibularis
Radiation of the tendon of the circumflexus or tensor palati muscle, forming the palatine aponeurosis
Radiation of the fibres of the levator palati muscle
Superior constrictor of the pharynx
M. constrictor pharyngis superior
Membrane continuous with the periosteum on the floor of the nasal fossæ
Palatopharyngeus muscle[1]
M. pharyngopalatinus
Interlacing of the fibres of the two levatores palati muscles
Palatoglossus muscle, or constrictor isthmi faucium[2]
M. glossopalatinus
Posterior pillar of the fauces[4]
Arcus pharyngopalatinus
Buccopharyngeal fascia
Fascia buccopharyngea
Uvula
Tonsil (amygdala)
Tonsilla palatina
Tonsil (amygdala)
Tonsilla palatina
Styloglossus muscle
Anterior pillar of the fauces[5]
Arcus glossopalatinus
Isthmus of the fauces
Isthmus faucium
Mucous membrane of the floor of the mouth
Upper surface, or dorsum, of the tongue
Dorsum linguæ
1/1

1 This muscle occupies the posterior pillar of the fauces.—Tr.
2 This muscle occupies the anterior pillar of the fauces.—Tr.
3 See note 5 to p. 416.
4 Known also as the *posterior palatine*, or *pharyngopalatine*, *arch.*
5 Known also as the *anterior palatine*, or *glossopalatine*, *arch.*

FIG. 667.—MUSCLES OF THE SOFT PALATE AND OF THE PILLARS OF THE FAUCES OR PALATINE ARCHES, SEEN FROM BEFORE. APONEUROTIC EXPANSION OF THE TENDON OF THE CIRCUMFLEXUS OR TENSOR PALATI MUSCLE (ATTACHED IN FRONT TO THE TRANSVERSE RIDGE ON THE LOWER SURFACE OF THE PALATE BONE, AND FORMING POSTERIORLY THE PALATINE APONEUROSIS); RETIFORM INTERLACEMENT OF THE FIBRES OF THE TWO LEVATORES PALATI MUSCLES.

On the left side the mucous membrane has been removed to show the connexion of the buccinator muscle with the superior constrictor of the pharynx through the intermediation of the pterygomaxillary or pterygomandibular ligament. The parts were prepared as in Fig. 666.

Palatopharyngeus muscle[3]
M. pharyngopalatinus
Motor uvulæ or azygos uvulæ muscle[1]—M. uvulæ
Interlacing fibres of origin of the two palatopharyngei muscles
Mucous membrane of the pharyngeal surface
Expansion of the tendon of the circumflexus or tensor palati muscle (palatine aponeurosis)
Palatine glands
Glandu æ palatinæ
Mucous membrane of the oral surface
2/1

FIG. 668.—TRANSVERSE SECTION THROUGH THE UPPERMOST PORTION OF THE SOFT PALATE, IN THE REGION OF THE APONEUROTIC EXPANSION OF THE CIRCUMFLEXUS OR TENSOR PALATI MUSCLE.

FIG 669.—TRANSVERSE SECTION THROUGH THE SOFT PALATE MIDWAY BETWEEN ITS ATTACHED AND FREE EXTREMITIES, IN THE REGION OF THE LEVATOR PALATI MUSCLE.

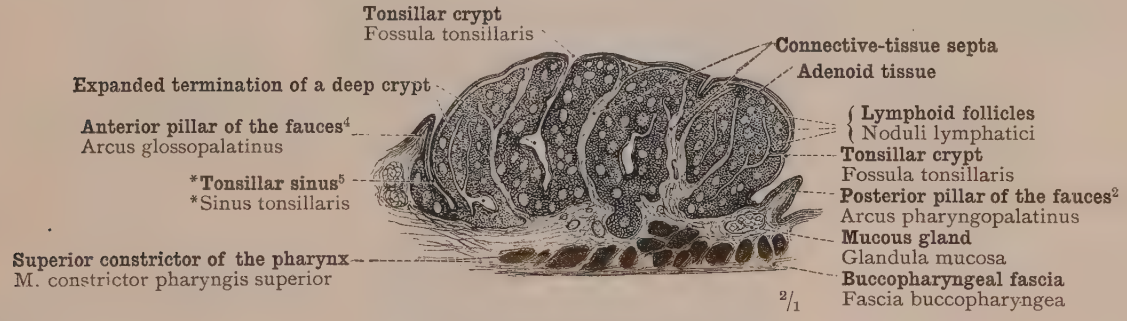


FIG. 670.—HORIZONTAL SECTION THROUGH A LARGE PROJECTING TONSIL (TONSILLA PALATINA) AND THROUGH THE PILLARS OF THE FAUCES. (FROM AN EXECUTED MALE CRIMINAL, AGED TWENTY-TWO YEARS.)

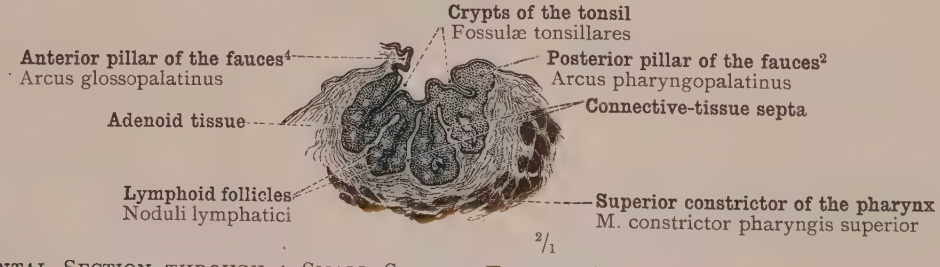


FIG. 671.—HORIZONTAL SECTION THROUGH A SMALL SUNKEN TONSIL (TONSILLA PALATINA) AND THROUGH THE PILLARS OF THE FAUCES. (FROM A FEMALE, AGED FIFTY-TWO YEARS.)

The posterior pillar is united with the tonsil.[5]

[1] The name *motor uvulæ*, suggested by Macalister, is to be preferred to the old and more familiar name *azygos uvulæ*, which was given to the muscle when it was erroneously supposed to be a single median muscle.—TR.
[2] Known also as the *posterior palatine*, or *pharyngopalatine, arch.*
[3] See note [1] to p. 417.
[4] Known also as the *anterior palatine*, or *glossopalatine, arch.*
[5] See note [4] to p. 415.

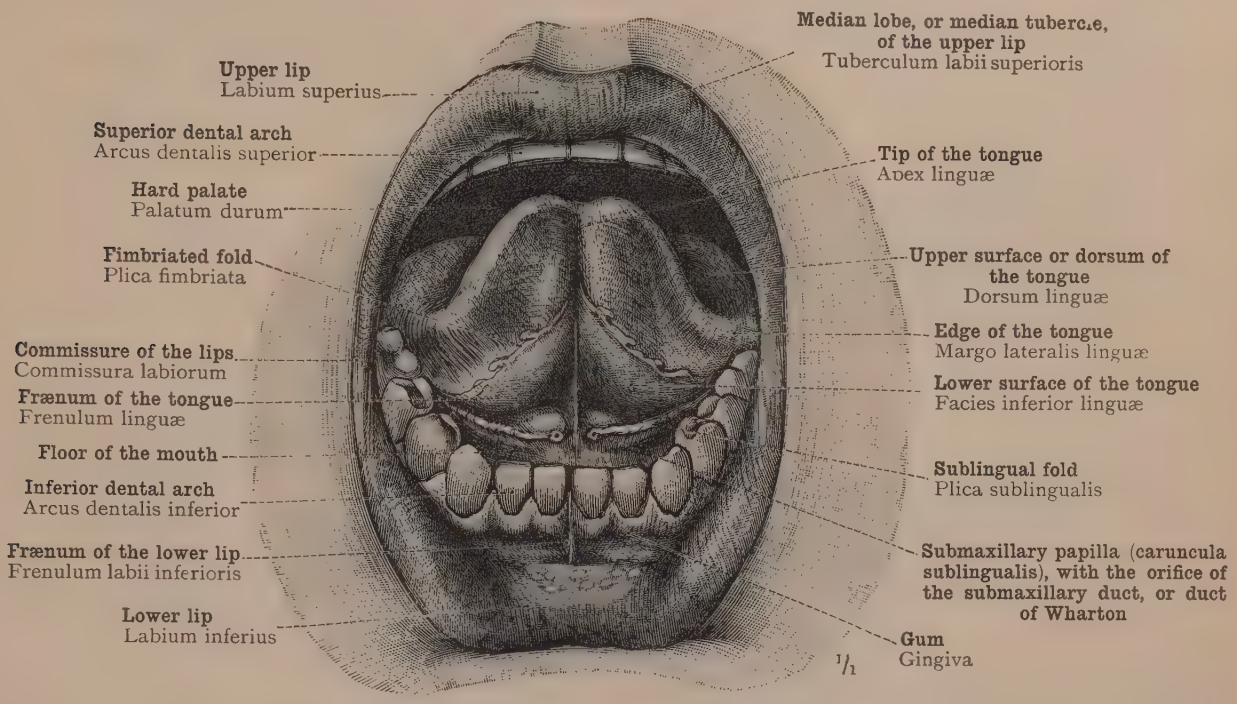
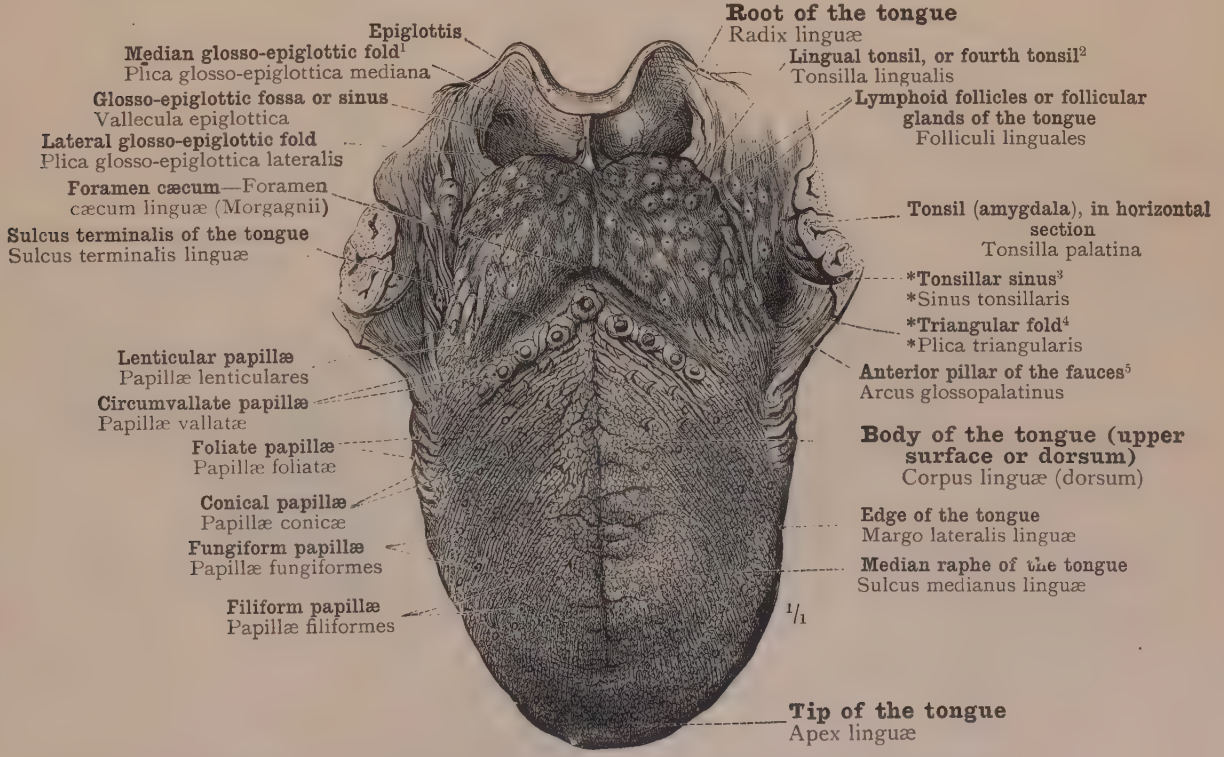
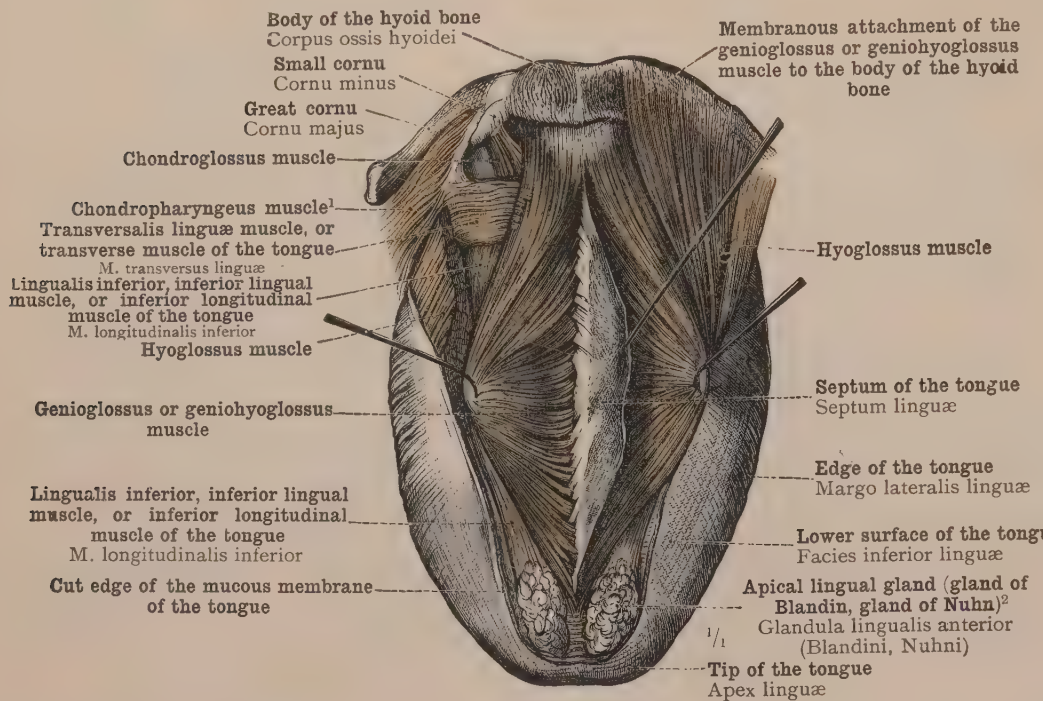


FIG. 672.—THE MOUTH, WIDELY OPENED, WITH THE TIP OF THE TONGUE DRAWN UPWARDS, TO SHOW THE FRÆNUM LINGUÆ, THE SUBLINGUAL FOLD, THE SUBMAXILLARY PAPILLA (CARUNCULA SUBLINGUALIS), AND THE FIMBRIATED FOLD.



[1] Or *frænum epiglottidis*. [2] See note 4 to p. 416, and note [1] to p. 411. [3] See note 4 to p. 415.
[4] See note 3 to p. 416. [5] Known also as the *anterior palatine*, or *glossopalatine*, *arch*.

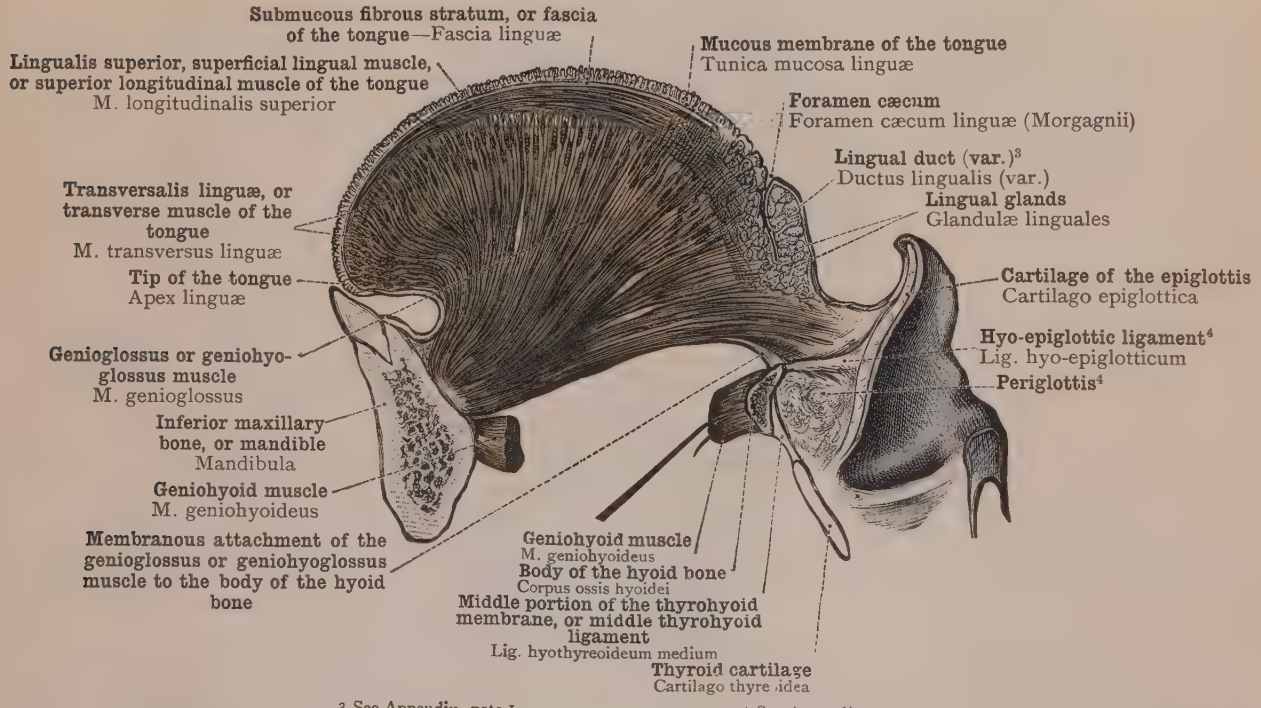
FIG. 673.—THE TONGUE, LINGUA, WITH THE EPIGLOTTIS: RADIX LINGUÆ, THE ROOT OF THE TONGUE; DORSUM LINGUÆ, THE UPPER SURFACE OF THE TONGUE; APEX LINGUÆ, THE TIP OF THE TONGUE.


Body of the hyoid bone
Corpus ossis hyoidei
Small cornu
Cornu minus
Great cornu
Cornu majus
Chondroglossus muscle
Chondropharyngeus muscle[1]
Transversalis linguæ muscle, or transverse muscle of the tongue
M. transversus linguæ
Lingualis inferior, inferior lingual muscle, or inferior longitudinal muscle of the tongue
M. longitudinalis inferior
Hyoglossus muscle
Genioglossus or geniohyoglossus muscle
Lingualis inferior, inferior lingual muscle, or inferior longitudinal muscle of the tongue
M. longitudinalis inferior
Cut edge of the mucous membrane of the tongue
Membranous attachment of the genioglossus or geniohyoglossus muscle to the body of the hyoid bone
Hyoglossus muscle
Septum of the tongue
Septum linguæ
Edge of the tongue
Margo lateralis linguæ
Lower surface of the tongue
Facies inferior linguæ
Apical lingual gland (gland of Blandin, gland of Nuhn)[2]
Glandula lingualis anterior
(Blandini, Nuhni)
1/1
Tip of the tongue
Apex linguæ

[1] *Chondropharyngeus Muscle.*—See Fig. 706, p. 433, and note [1] to same page.
[2] This is not a single gland on each side, but a group of glands aggregated into a small oblong mass. Most of the glands are acinotubular.—Tr.

FIG. 674.—MUSCLES OF THE TONGUE WITH THE SEPTUM LINGUÆ AND THE APICAL LINGUAL GLANDS (GLANDS OF BLANDIN OR NUHN, GLANDULÆ LINGUALES ANTERIORES).

On the left side the hyoglossus muscle has been removed, to display the chondroglossus and transversalis linguæ muscles.



[3] See Appendix, note [1].
[4] See Appendix, note [2].

FIG. 675.—THE TONGUE, WITH THE INFERIOR MAXILLARY BONE, THE HYOID BONE, AND THE EPIGLOTTIS, IN SAGITTAL SECTION. MUSCLES AND MUCOUS MEMBRANE OF THE TONGUE; GLANDULÆ LINGUALES, LINGUAL GLANDS; DUCTUS LINGUALIS, LINGUAL DUCT.

The larynx has been drawn somewhat away from the tongue.

Cavum oris—The oral cavity.

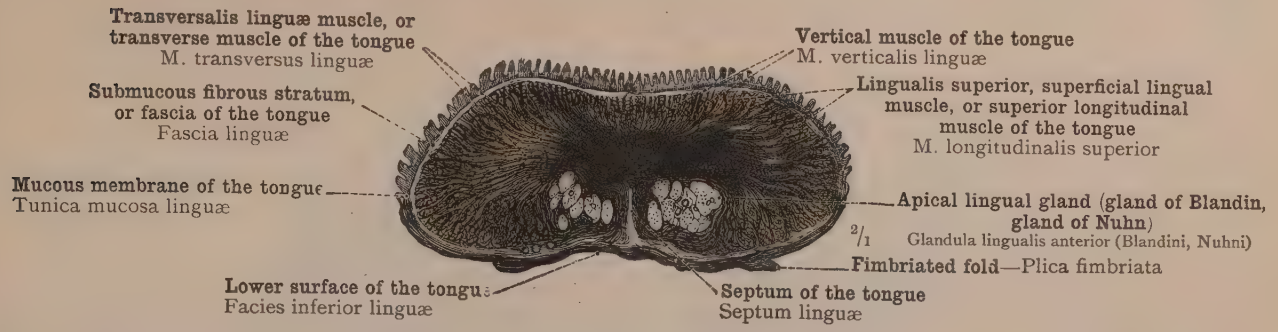

Transversalis linguæ muscle, or transverse muscle of the tongue
M. transversus linguæ
Submucous fibrous stratum, or fascia of the tongue
Fascia linguæ
Mucous membrane of the tongue
Tunica mucosa linguæ
Lower surface of the tongue
Facies inferior linguæ
Vertical muscle of the tongue
M. verticalis linguæ
Lingualis superior, superficial lingual muscle, or superior longitudinal muscle of the tongue
M. longitudinalis superior
Apical lingual gland (gland of Blandin, gland of Nuhn)
Glandula lingualis anterior (Blandini, Nuhni)
2/1
Fimbriated fold—Plica fimbriata
Septum of the tongue
Septum linguæ

FIG. 676.—CORONAL SECTION THROUGH THE TIP OF THE TONGUE. GLANDULA LINGUALIS ANTERIOR, APICAL LINGUAL GLAND (GLAND OF BLANDIN, GLAND OF NUHN).

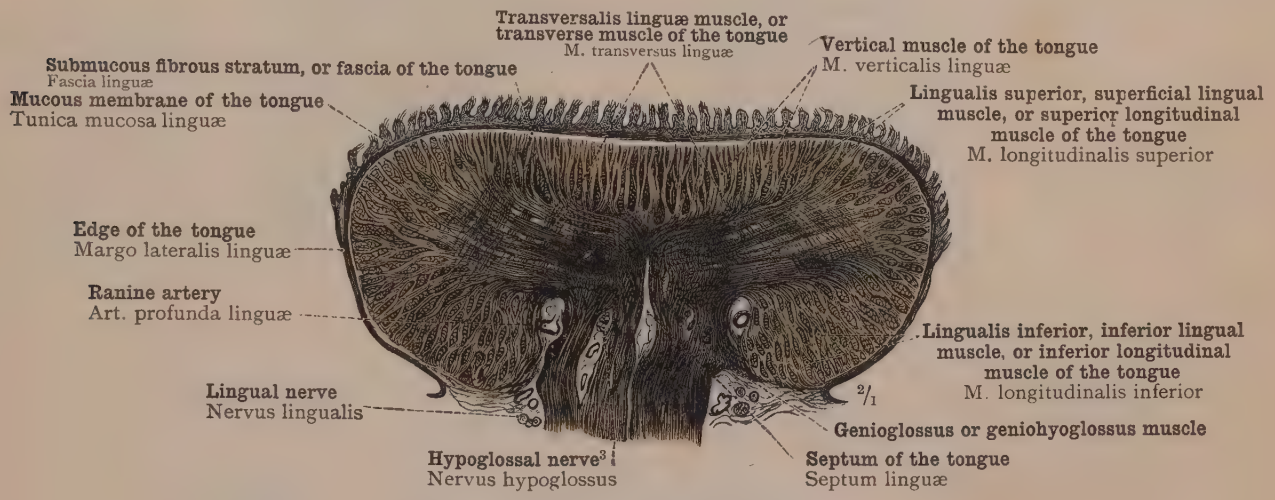

Transversalis linguæ muscle, or transverse muscle of the tongue
M. transversus linguæ
Submucous fibrous stratum, or fascia of the tongue
Fascia linguæ
Mucous membrane of the tongue
Tunica mucosa linguæ
Vertical muscle of the tongue
M. verticalis linguæ
Lingualis superior, superficial lingual muscle, or superior longitudinal muscle of the tongue
M. longitudinalis superior
Edge of the tongue
Margo lateralis linguæ
Ranine artery
Art. profunda linguæ
Lingualis inferior, inferior lingual muscle, or inferior longitudinal muscle of the tongue
M. longitudinalis inferior
Lingual nerve
Nervus lingualis
2/1
Genioglossus or geniohyoglossus muscle
Hypoglossal nerve[3]
Nervus hypoglossus
Septum of the tongue
Septum linguæ

FIG. 677.—CORONAL SECTION THROUGH THE BODY OF THE TONGUE.

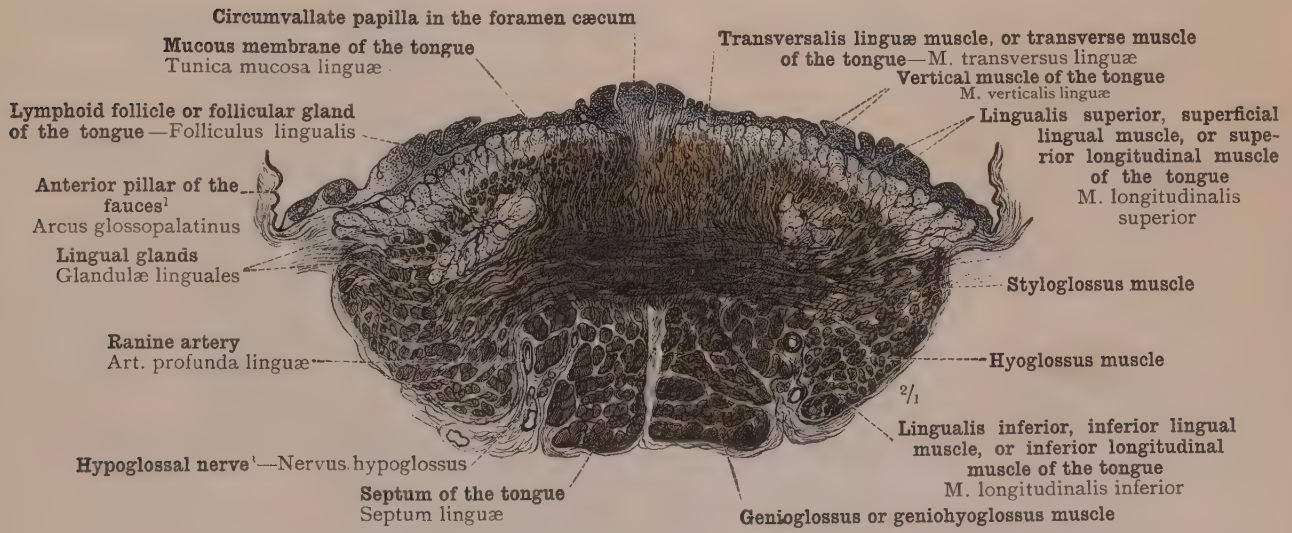

Circumvallate papilla in the foramen cæcum
Mucous membrane of the tongue
Tunica mucosa linguæ
Transversalis linguæ muscle, or transverse muscle of the tongue—M. transversus linguæ
Vertical muscle of the tongue
M. verticalis linguæ
Lymphoid follicle or follicular gland of the tongue—Folliculus lingualis
Lingualis superior, superficial lingual muscle, or superior longitudinal muscle of the tongue
M. longitudinalis superior
Anterior pillar of the fauces[1]
Arcus glossopalatinus
Lingual glands
Glandulæ linguales
Styloglossus muscle
Ranine artery
Art. profunda linguæ
Hyoglossus muscle
2/1
Lingualis inferior, inferior lingual muscle, or inferior longitudinal muscle of the tongue
M. longitudinalis inferior
Hypoglossal nerve[1]—Nervus hypoglossus
Septum of the tongue
Septum linguæ
Genioglossus or geniohyoglossus muscle

FIG. 678.—CORONAL SECTION THROUGH THE MOST ANTERIOR PORTION OF THE ROOT OF THE TONGUE. LINGUAL GLANDS.

The section passes through a circumvallate papilla which in this specimen occupies the site of the foramen cæcum.

THE ARRANGEMENT OF THE MUSCLES OF THE TONGUE, AS DISPLAYED BY CORONAL SECTIONS THROUGH THE ORGAN.[2]

[1] Known also as the *anterior palatine*, or *glossopalatine*, *arch*.

[2] Macalister speaks of the intrinsic muscles of the tongue as *strata*, four in number, viz., *stratum longitudinale inferius*, *stratum longitudinale superius*, *stratum transversum*, and *stratum perpendiculare*.—TR.

[3] Or *twelfth cranial nerve*, in Scemerring's enumeration; *ninth cranial nerve*, in that of Willis. Sometimes known as the *lingual motor nerve*.—TR.

Cavum oris—The oral cavity.

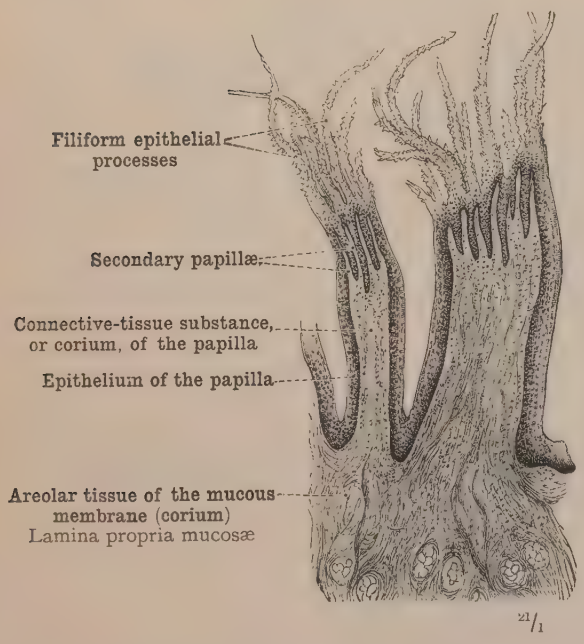


FIG. 679.—PAPILLÆ FILIFORMES, FILIFORM PAPILLÆ OF THE TONGUE. VERY LARGE FORM, WHICH PROJECTS MARKEDLY FROM THE SURFACE. LONGITUDINAL SECTION.

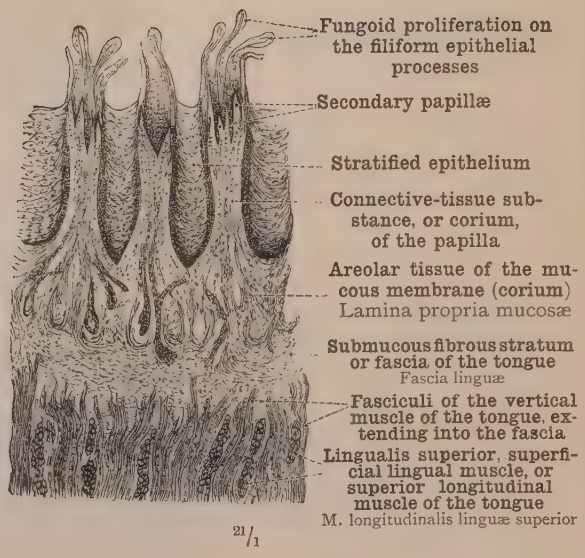

Fungoid proliferation on the filiform epithelial processes
Secondary papillæ
Stratified epithelium
Connective-tissue substance, or corium, of the papilla
Areolar tissue of the mucous membrane (corium)
Lamina propria mucosæ
Submucous fibrous stratum or fascia of the tongue
Fascia linguæ
Fasciculi of the vertical muscle of the tongue, extending into the fascia
Lingualis superior, superficial lingual muscle, or superior longitudinal muscle of the tongue
M. longitudinalis linguæ superior
21/1

FIG. 680.—PAPILLÆ FILIFORMES, FILIFORM PAPILLÆ OF THE TONGUE. SMALL FORM, WHICH PROJECTS BUT SLIGHTLY FROM THE SURFACE. LONGITUDINAL SECTION.

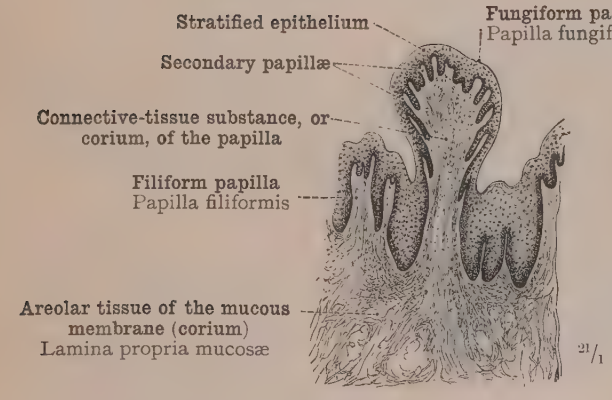


FIG. 681.—PAPILLA FUNGIFORMIS, FUNGIFORM PAPILLA OF THE TONGUE, IN LONGITUDINAL SECTION.

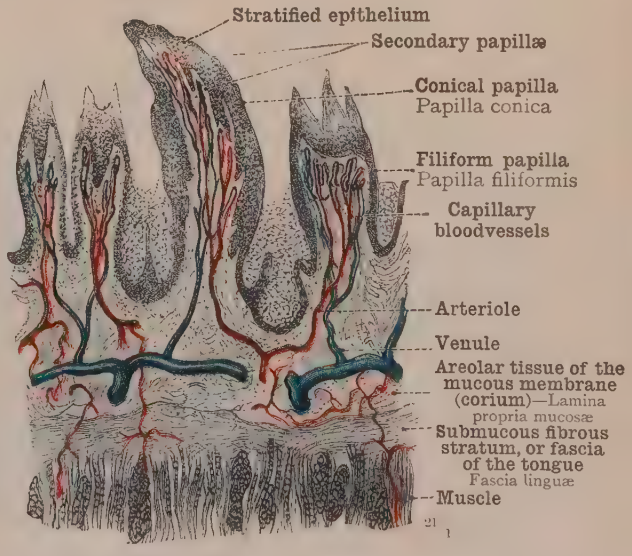


FIG. 682.—PAPILLA CONICA, CONICAL PAPILLA OF THE TONGUE, AMONG FILIFORM PAPILLÆ, IN LONGITUDINAL SECTION.

The bloodvessels of the mucous membrane have been injected: the arteries, red; the veins, blue.

Cavum oris—The oral cavity.

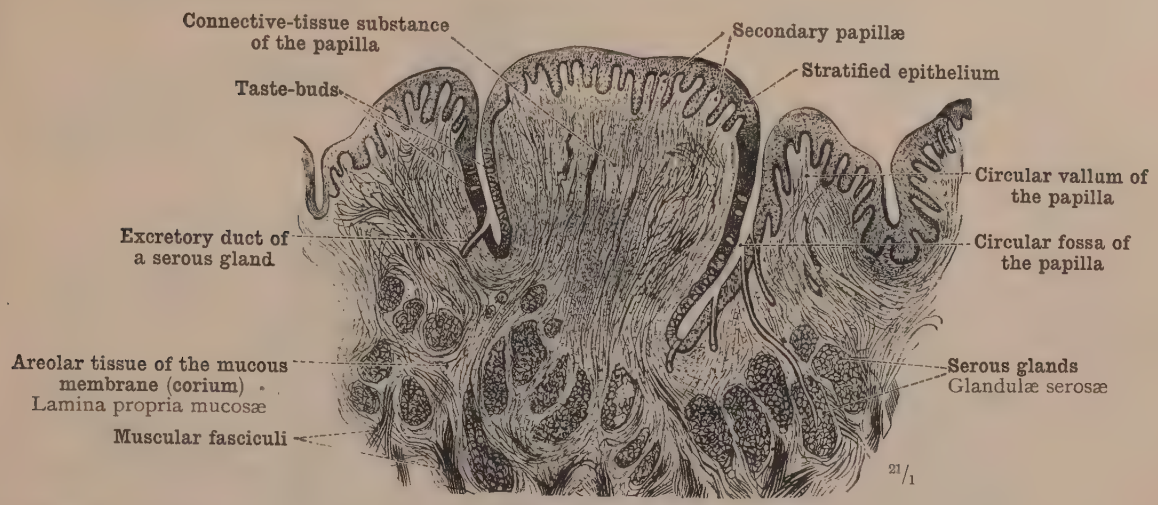


FIG. 683.—PAPILLA VALLATA, CIRCUMVALLATE PAPILLA OF THE TONGUE, IN LONGITUDINAL SECTION.

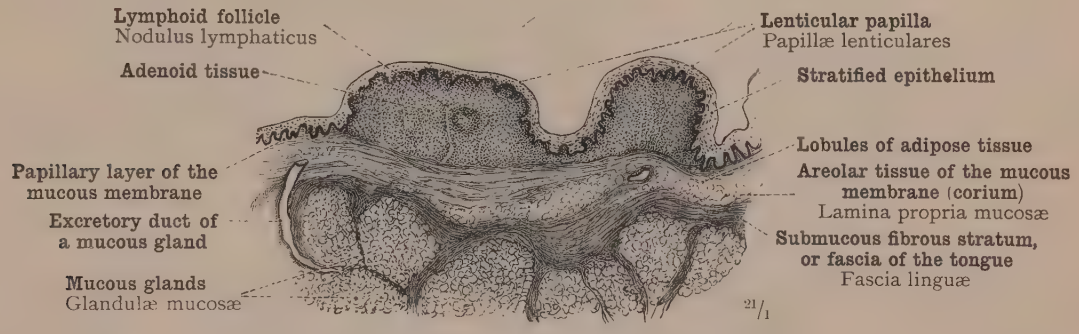


FIG. 684.—TWO LENTICULAR PAPILLÆ OF THE TONGUE, IN LONGITUDINAL SECTION.

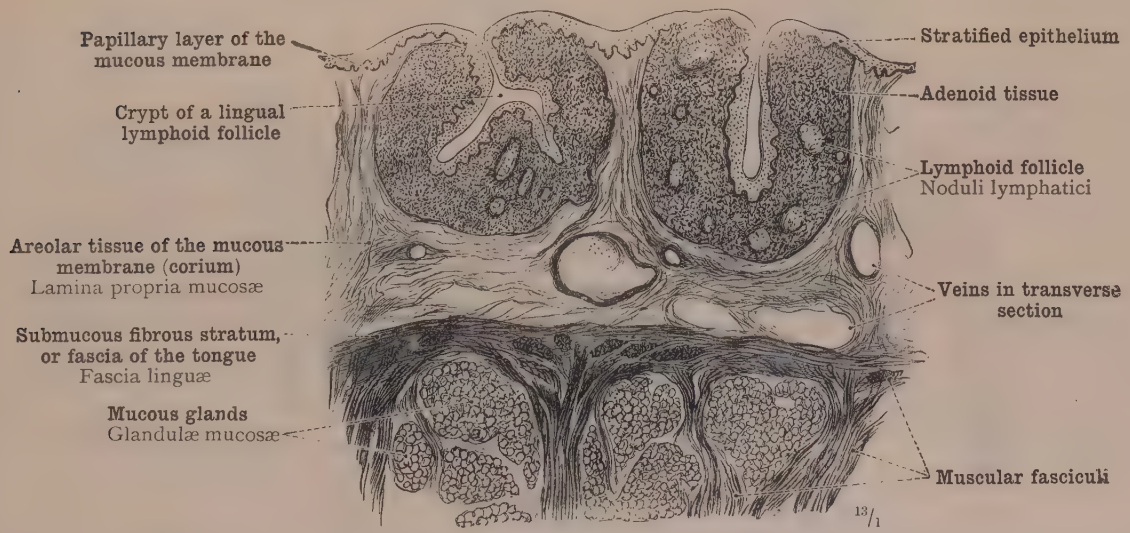
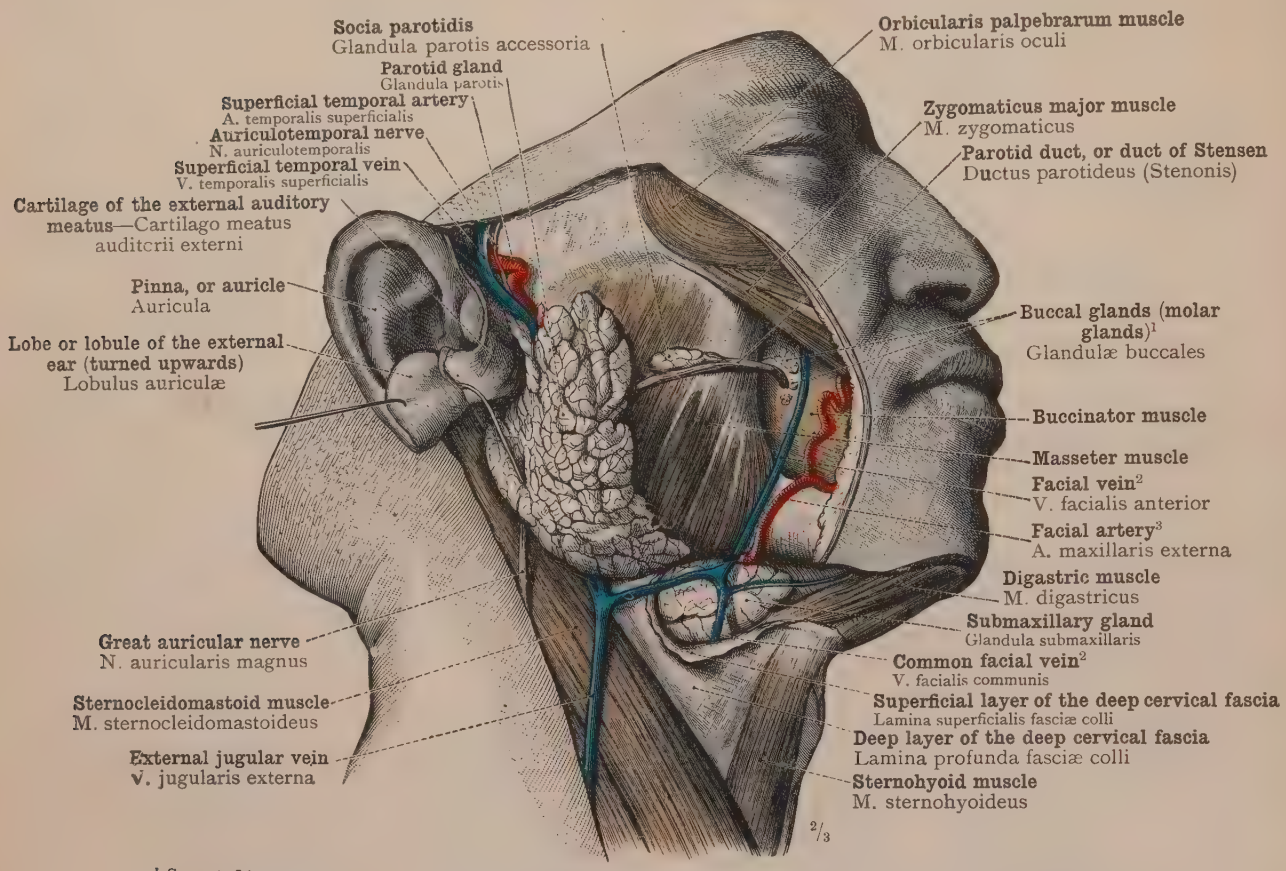


FIG. 685.—TWO LINGUAL LYMPHOID FOLLICLES, OR FOLLICULAR GLANDS OF THE TONGUE, IN LONGITUDINAL SECTION.

Cavum oris—The oral cavity.

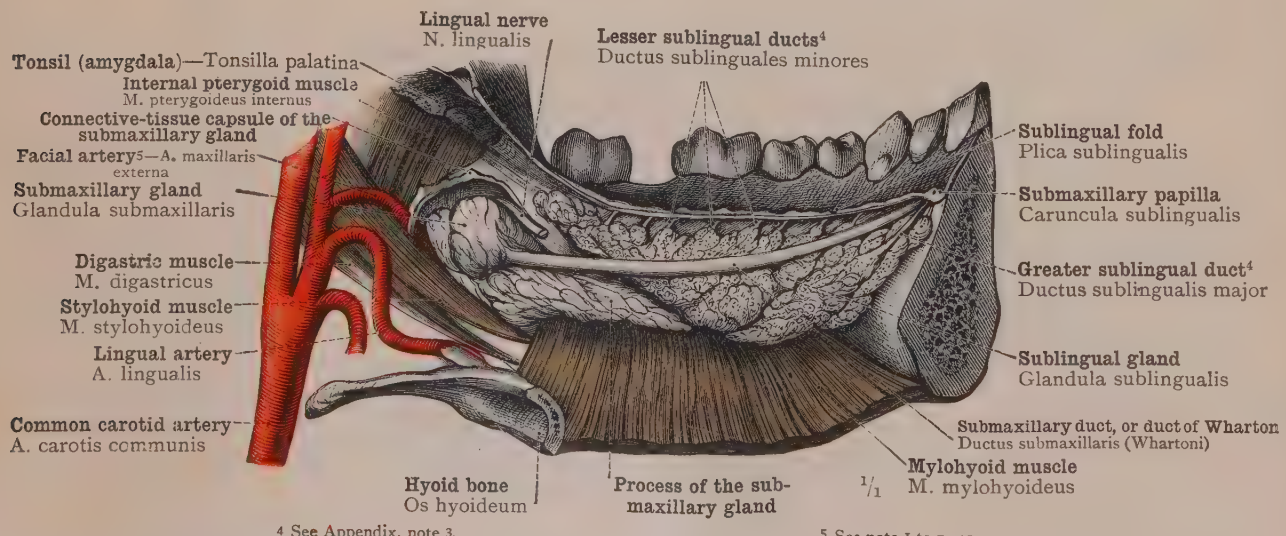


[1] See note [1] to p. 413.

[2] In the author's nomenclature, the *facial* vein and the *temporomaxillary* vein of English anatomists are termed *anterior* and *posterior facial*, respectively, and the short trunk formed by the union of the facial vein with the anterior division of the temporomaxillary vein is termed the *common facial* vein.—Tr.

[3] See note [1] to p. 410.

FIG. 686.—GLANDULA PAROTIS, THE PAROTID GLAND; GLANDULA SUBMAXILLARIS, THE SUBMAXILLARY GLAND. RIGHT SIDE.

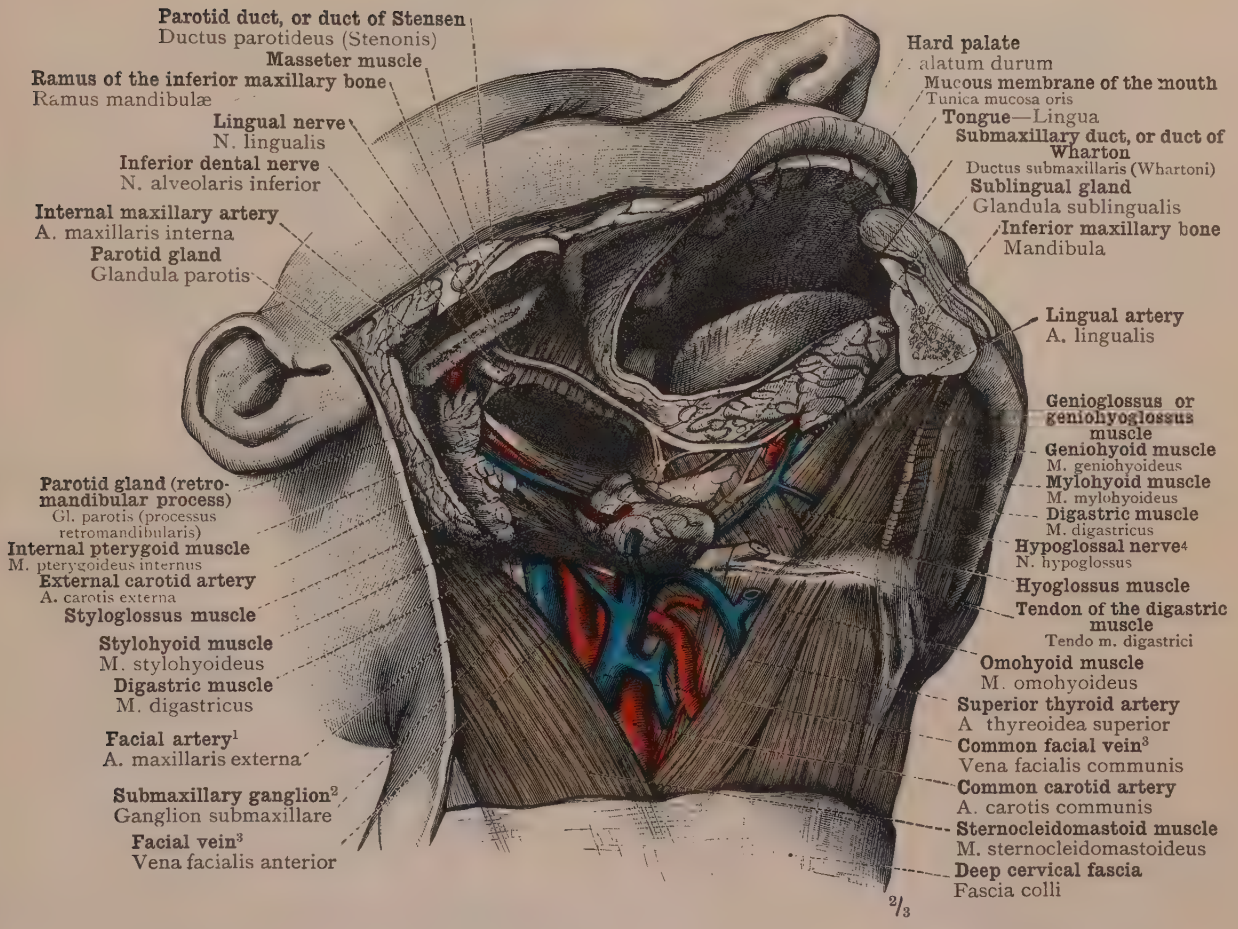


[4] See Appendix, note 3.

[5] See note [1] to p. 410.

FIG. 687.—GLANDULA SUBLINGUALIS, THE SUBLINGUAL GLAND, WITH A PORTION OF THE SUBMAXILLARY GLAND, SEEN FROM THE INNER (ORAL) SIDE. EXCRETORY DUCTS OF THESE GLANDS. LEFT SIDE.

Glandulæ salivales—Salivary glands.



[1] See note [1] to p. 410. [2] Sometimes known as the *lingual* ganglion. [3] See note [2] to p. 424.
[4] Or *twelfth cranial nerve*, in Sœmerring's enumeration; *ninth cranial nerve*, in that of Willis. Sometimes known as the *lingual motor nerve*.—Tr.

FIG. 688.—GLANDULA SUBLINGUALIS, THE SUBLINGUAL GLAND; GLANDULA SUBMAXILLARIS, THE SUBMAXILLARY GLAND; GLANDULA PAROTIS, THE PAROTID GLAND: DISPLAYED ON THE RIGHT SIDE OF THE BODY AFTER THE REMOVAL OF A PORTION OF THE INFERIOR MAXILLARY BONE. RELATIONS OF THESE GLANDS TO MUSCLES, VESSELS, AND NERVES.

The anterior edge of the parotid gland with the adjoining portion of the parotid duct has been removed.

Glandulæ salivales—Salivary glands.

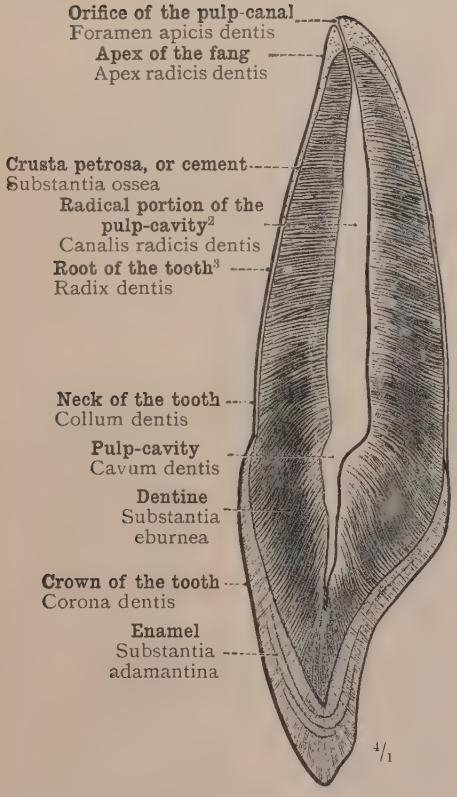


FIG. 689.—DENS INCISIVUS SUPERIOR MEDIALIS, UPPER CENTRAL OR MESIAL INCISIOR TOOTH, IN SAGITTAL SECTION. SUBSTANTIA EBURNEA, THE DENTINE; SUBSTANTIA ADAMANTINA, THE ENAMEL; SUBSTANTIA OSSEA, THE CEMENT OR CRUSTA PETROSA; CAVUM DENTIS, THE PULP-CAVITY; CANALIS RADICIS DENTIS, THE PULP-CANAL.[2]

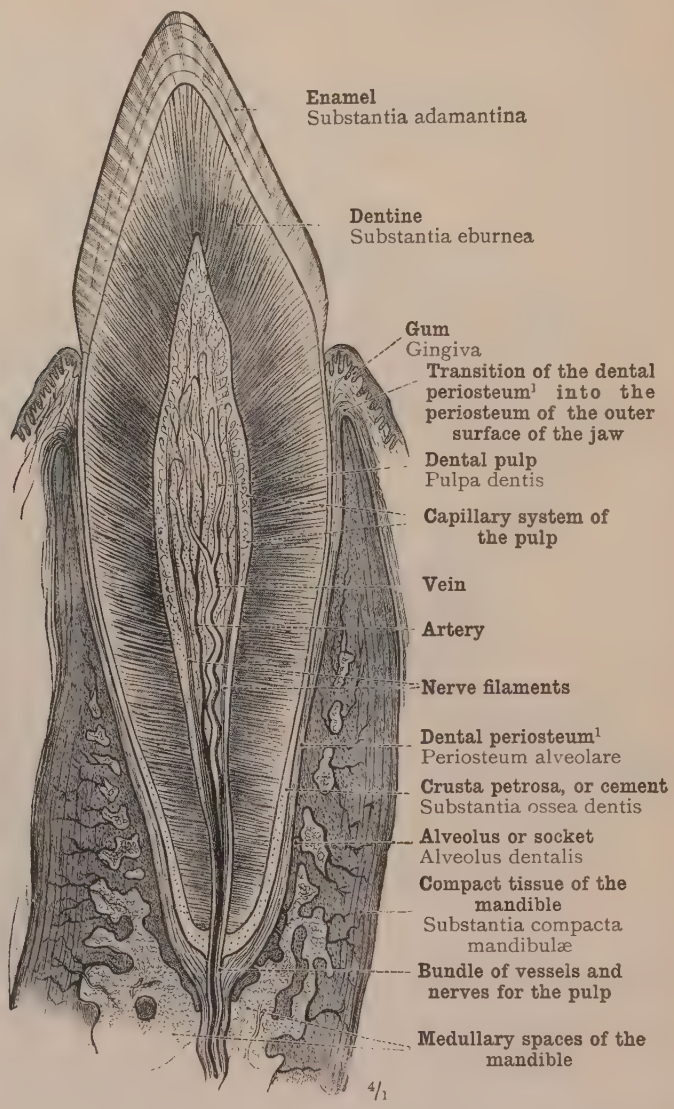


FIG. 690.—DENS CANINUS INFERIOR, LOWER CANINE TOOTH, WITH THE ALVEOLAR PORTION OF THE MANDIBLE, THE GUM, THE DENTAL PERIOSTEUM, AND THE DENTAL PULP, IN LONGITUDINAL SECTION.

Dentine of the root of the tooth
Substantia eburnea radicis dentis
Pulp-canal[2]
Canalis radicis dentis
Crusta petrosa, or cement, of the root of the tooth
Substantia ossea radicis dentis
Dental periosteum[1]
Periosteum alveolare
Wall of the alveolus
Medullary spaces of the alveolar process of the maxilla
4/1

FIG. 691.—THE ROOT OF THE UPPER CENTRAL OR MESIAL INCISOR TOOTH WITH THE ALVEOLUS AND THE DENTAL PERIOSTEUM, IN TRANSVERSE SECTION.

[1] The soft vascular tissue between the crusta petrosa or cement of the root and the bone, called here simply *dental periosteum*, is sometimes divisible into two layers: an outer, the *alveolar periosteum*, and an inner, the *peri-odontal membrane*. By some, also, the dental periosteum is named the *pericemental membrane*.—TR.

[2] The term *pulp-canal*, which is in England applied to the minute canal by which the pulp-cavity is entered through the root of the tooth, does not appear to correspond strictly to the author's term *canalis radicis dentis*, which is applied by him alike to the *pulp-canal* and to the *radical portion of the pulp-cavity*.—TR.

[3] The term *root* is applied to all that portion of a tooth which is sunk in the alveolus. This root may consist of one or more *fangs*.—TR.

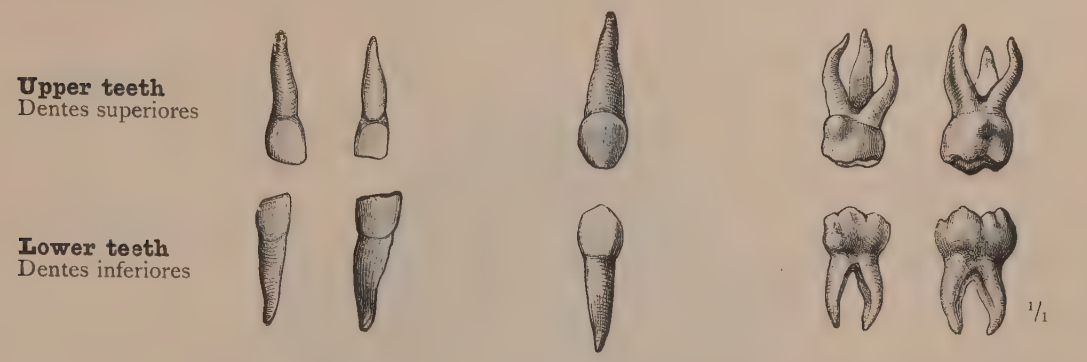


Fig. 692.—Dentes Decidui, Temporary or Deciduous Teeth, or Milk-Teeth, seen from their Outer (Labial and Buccal) Sides.

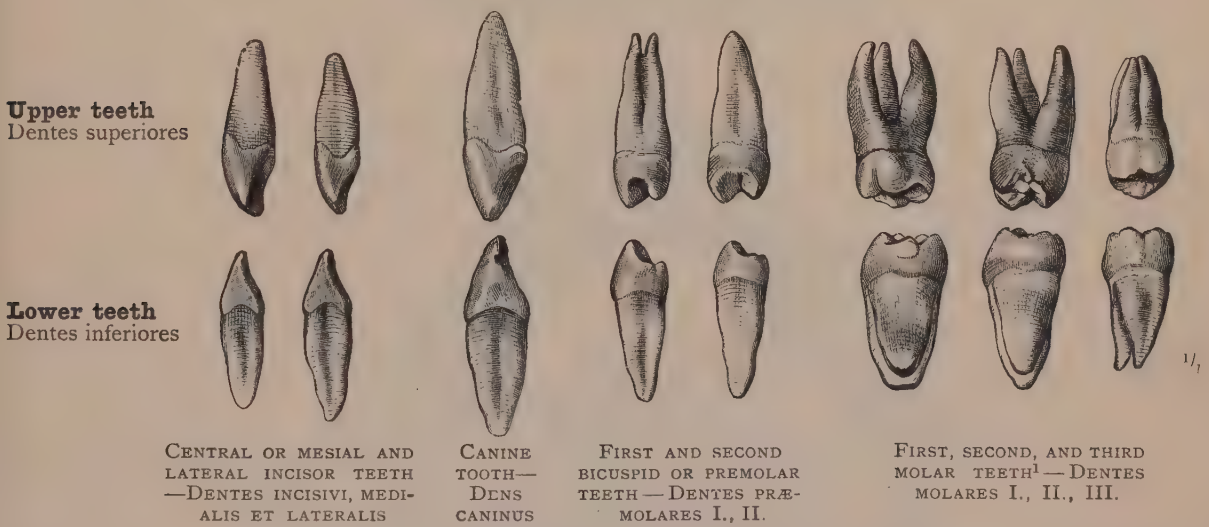

Upper teeth
Dentes superiores
Lower teeth
Dentes inferiores
1/1
Central or mesial and lateral incisor teeth—Dentes incisivi, medialis et lateralis
Canine tooth—Dens caninus
First and second bicuspid or premolar teeth—Dentes præmolares I., II.
First, second, and third molar teeth[1]—Dentes molares I., II., III.

Fig. 693.—Dentes Permanentes, Permanent Teeth, showing the Outer Edge of the Incisors and Canines, and the Posterior Surface of the Premolars and Molars.

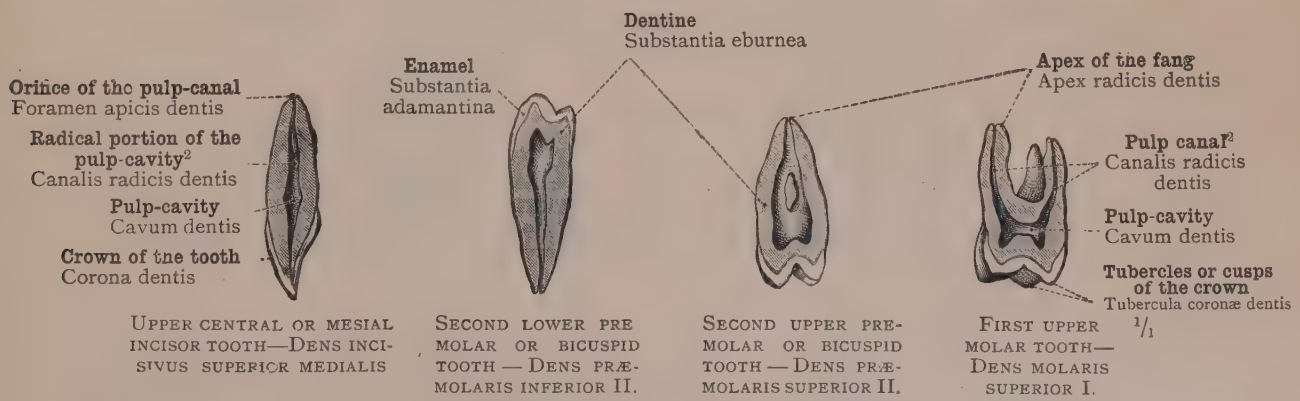


Fig. 694.—Pulp-Cavity and Pulp-Canal as seen in Teeth divided longitudinally.

[1] Known also as *grinders* or *multicuspids*.

[2] See note [2] to p. 426.

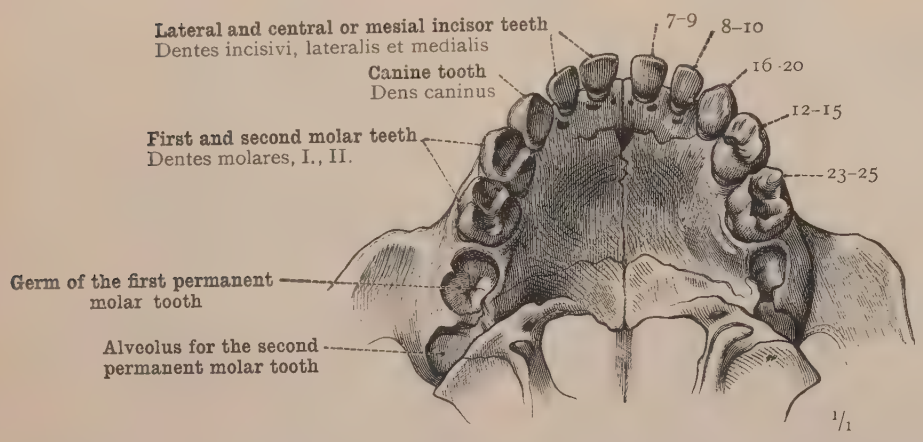


FIG. 695.—DENTES DECIDUI, TEMPORARY OR DECIDUOUS TEETH, OR MILK-TEETH, OF THE UPPER JAW OF A BOY AGED THREE YEARS.

The Arabic numerals indicate the months of life in which the eruption of the individual teeth usually occurs.

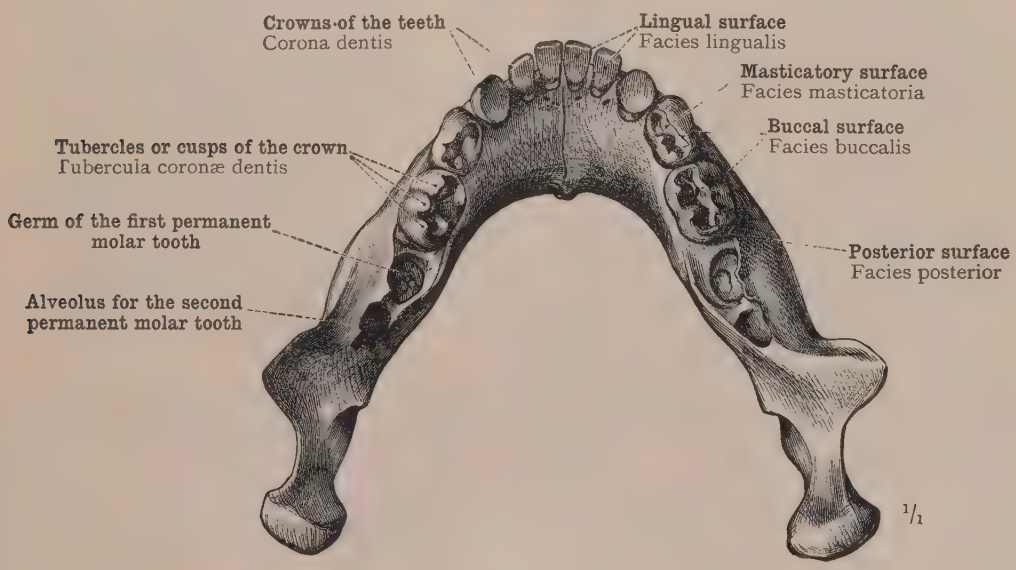


FIG. 696.—DENTES DECIDUI, TEMPORARY OR DECIDUOUS TEETH, OR MILK-TEETH, OF THE LOWER JAW OF A BOY AGED THREE YEARS.

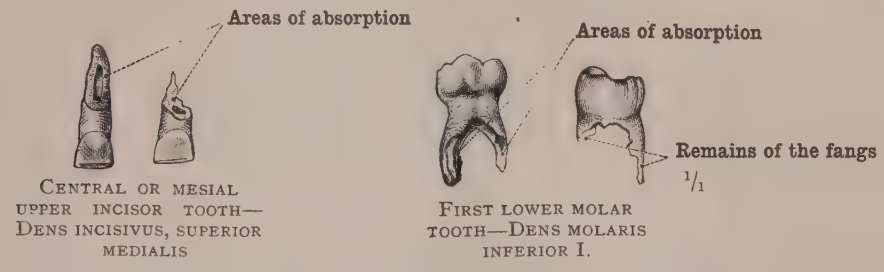

Areas of absorption
Areas of absorption
Remains of the fangs
1/1
CENTRAL OR MESIAL UPPER INCISOR TOOTH—DENS INCISIVUS, SUPERIOR MEDIALIS
FIRST LOWER MOLAR TOOTH—DENS MOLARIS INFERIOR I.

FIG. 697.—DENTES DECIDUI, TEMPORARY OR DECIDUOUS TEETH, OR MILK-TEETH, IN VARIOUS STAGES OF ABSORPTION, PREPARATORY TO THEIR BEING SHED AND REPLACED BY THE PERMANENT TEETH.

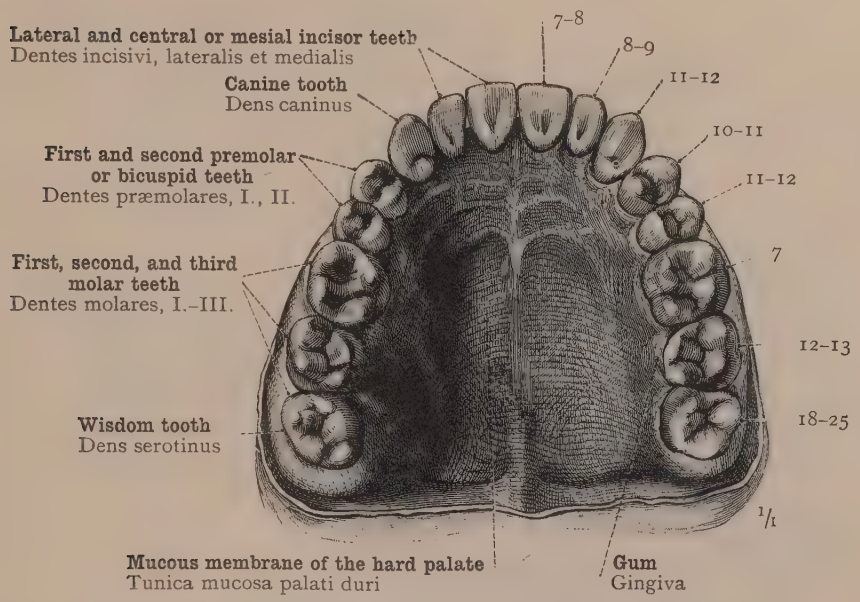


FIG. 698.—DENTES PERMANENTES, PERMANENT TEETH, OF THE UPPER JAW OF A MAN AGED TWENTY-SIX YEARS, WITH THE GUMS. FACIES MASTICATORIÆ, MASTICATORY SURFACES.

The Arabic numerals indicate the years of life in which the eruption of the individual teeth usually occurs.

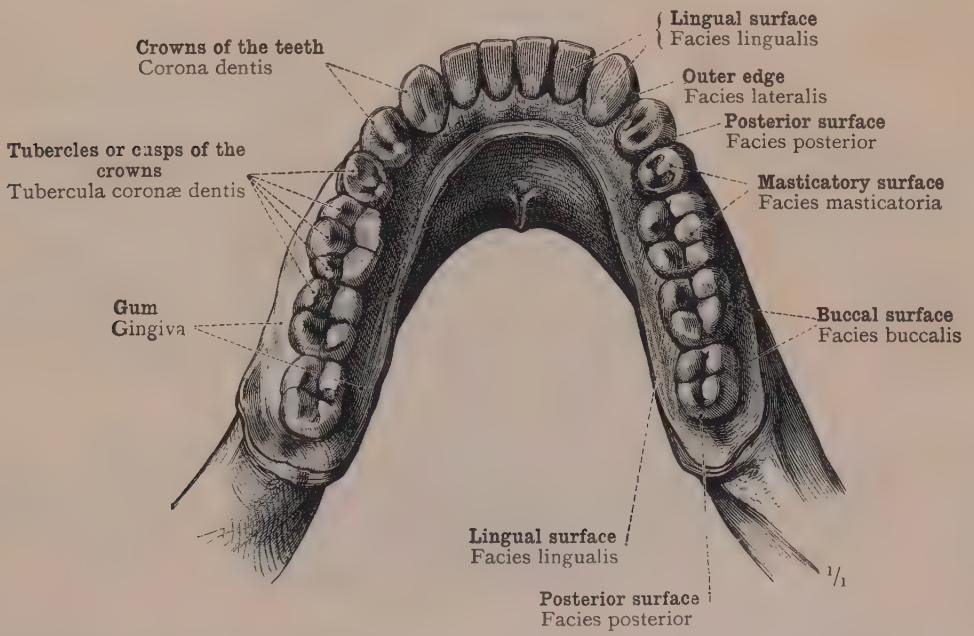


FIG. 699.—DENTES PERMANENTES, PERMANENT TEETH, OF THE LOWER JAW OF A MAN AGED TWENTY-SIX YEARS, WITH THE GUMS. FACIES MASTICATORIÆ, MASTICATORY SURFACES.

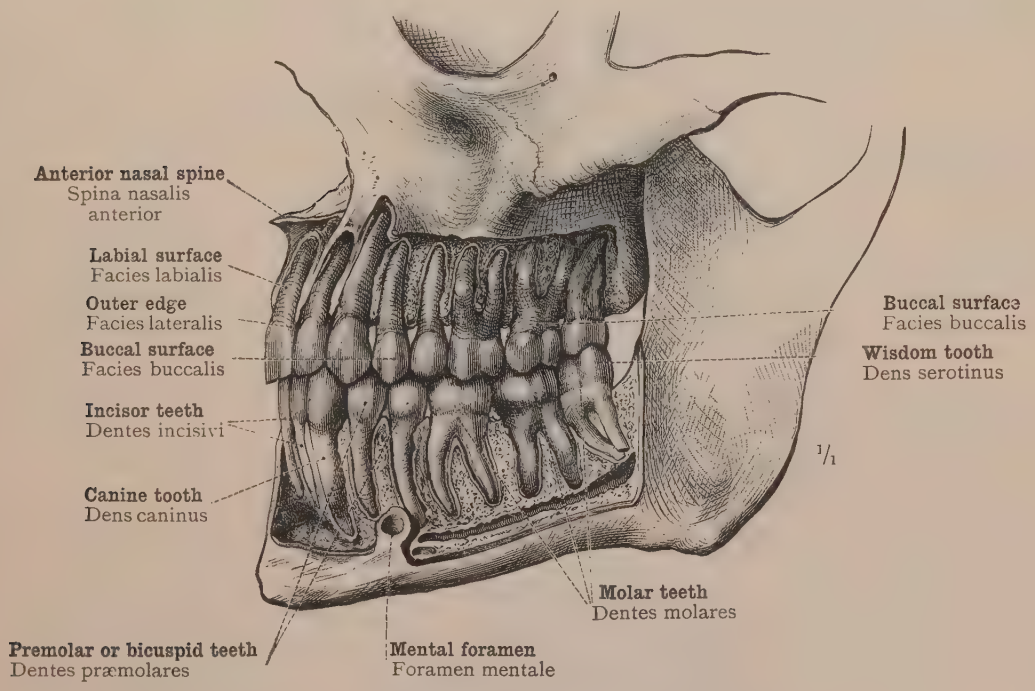


FIG. 700.—LEFT HALF OF THE PERMANENT TEETH, WITH THE ROOTS LAID BARE, SEEN FROM THEIR OUTER (LABIAL AND BUCCAL) SIDES. NORMAL RELATIVE POSITIONS OF UPPER AND LOWER ROWS.

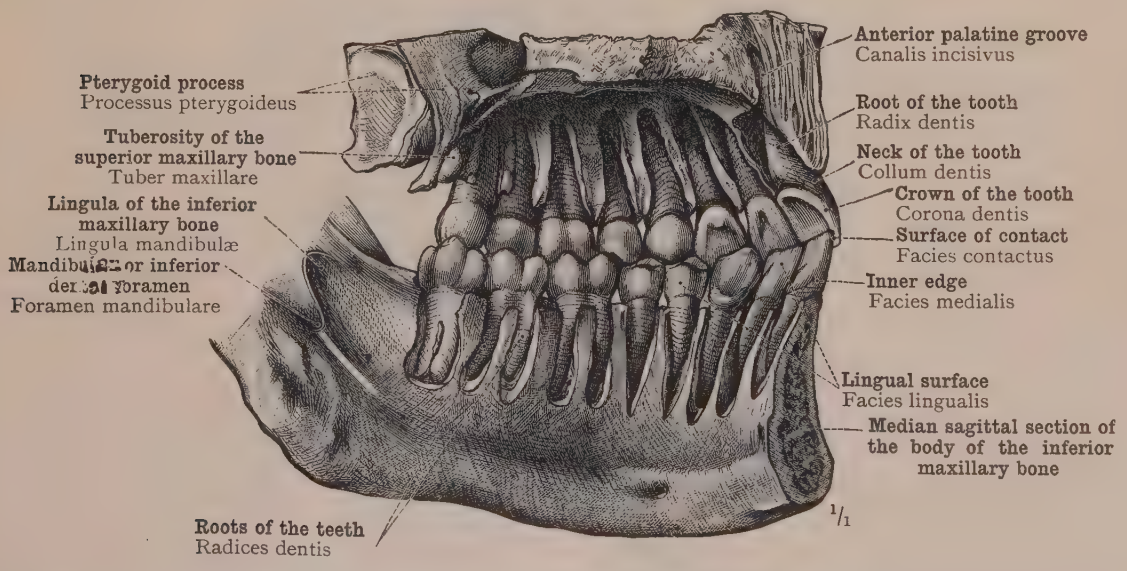


FIG. 701.—LEFT HALF OF THE PERMANENT TEETH, WITH THE ROOTS LAID BARE, SEEN FROM THEIR INNER (LINGUAL) SIDES. NORMAL RELATIVE POSITIONS OF UPPER AND LOWER ROWS.

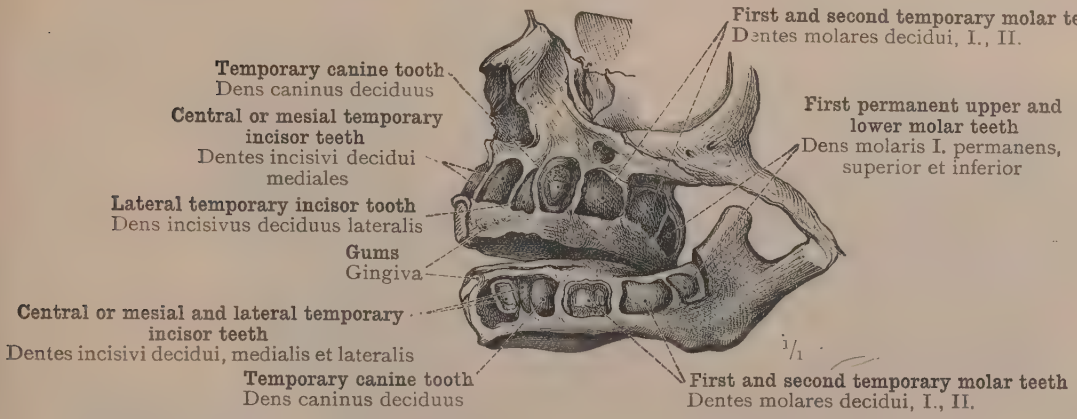

First and second temporary molar teeth
Dentes molares decidui, I., II.
Temporary canine tooth
Dens caninus deciduus
Central or mesial temporary incisor teeth
Dentes incisivi decidui mediales
Lateral temporary incisor tooth
Dens incisivus deciduus lateralis
Gums
Gingiva
First permanent upper and lower molar teeth
Dens molaris I. permanens, superior et inferior
Central or mesial and lateral temporary incisor teeth
Dentes incisivi decidui, medialis et lateralis
Temporary canine tooth
Dens caninus deciduus
1/1
First and second temporary molar teeth
Dentes molares decidui, I., II.

FIG. 702.—DENTAL GERMS (DENTAL SACS) OF AN INFANT BORN AT FULL TERM, DISPLAYED BY THE REMOVAL OF THE WALLS OF THE ALVEOLI ON THE LEFT SIDE OF THE FACE.

The dental sacs of the upper canine, the lower central incisor, and the first lower molar temporary teeth have been opened, in order to show the teeth developing in their interior.

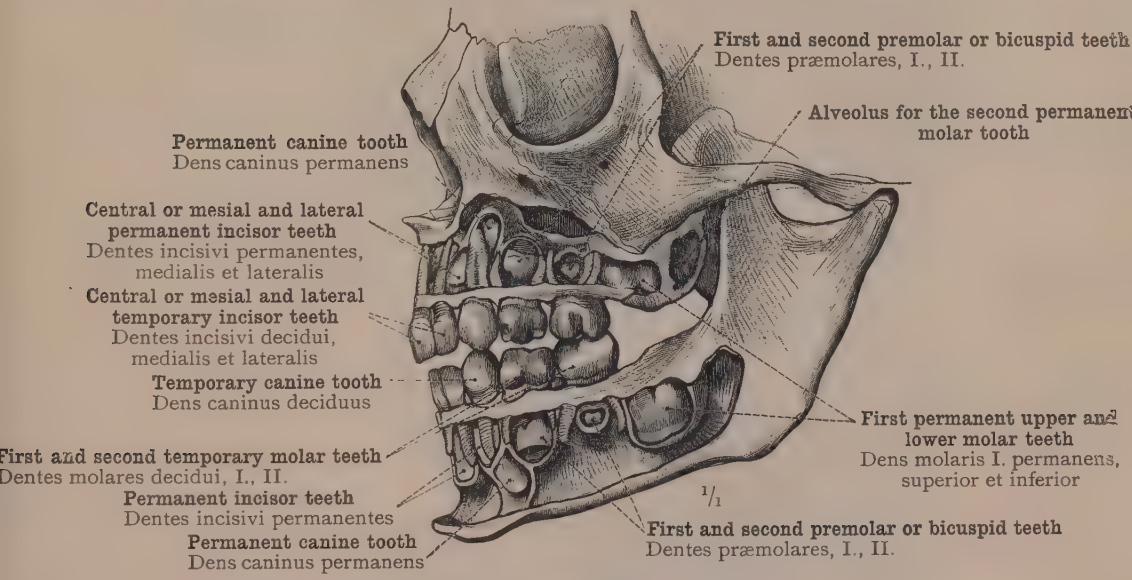

First and second premolar or bicuspid teeth
Dentes præmolares, I., II.
Alveolus for the second permanent molar tooth
Permanent canine tooth
Dens caninus permanens
Central or mesial and lateral permanent incisor teeth
Dentes incisivi permanentes, medialis et lateralis
Central or mesial and lateral temporary incisor teeth
Dentes incisivi decidui, medialis et lateralis
Temporary canine tooth
Dens caninus deciduus
First permanent upper and lower molar teeth
Dens molaris I. permanens, superior et inferior
First and second temporary molar teeth
Dentes molares decidui, I., II.
Permanent incisor teeth
Dentes incisivi permanentes
Permanent canine tooth
Dens caninus permanens
1/1
First and second premolar or bicuspid teeth
Dentes præmolares, I., II.

FIG. 703.—LEFT HALF OF THE TEMPORARY OR DECIDUOUS TEETH, OR MILK-TEETH, OF A BOY AGED TWO AND A HALF YEARS.

By the removal of the appropriate portions of the alveolar walls, the germs of the permanent teeth have been exposed, and the relation of these germs to the roots of the temporary teeth has been made manifest.

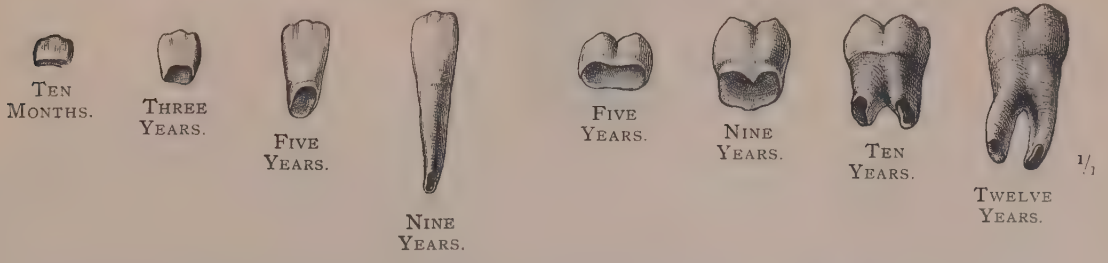


FIG. 704.—STAGES OF DEVELOPMENT OF THE LATERAL PERMANENT INCISOR TOOTH AND OF THE SECOND LOWER PERMANENT MOLAR TOOTH.

The fourth tooth of each series was already cut.

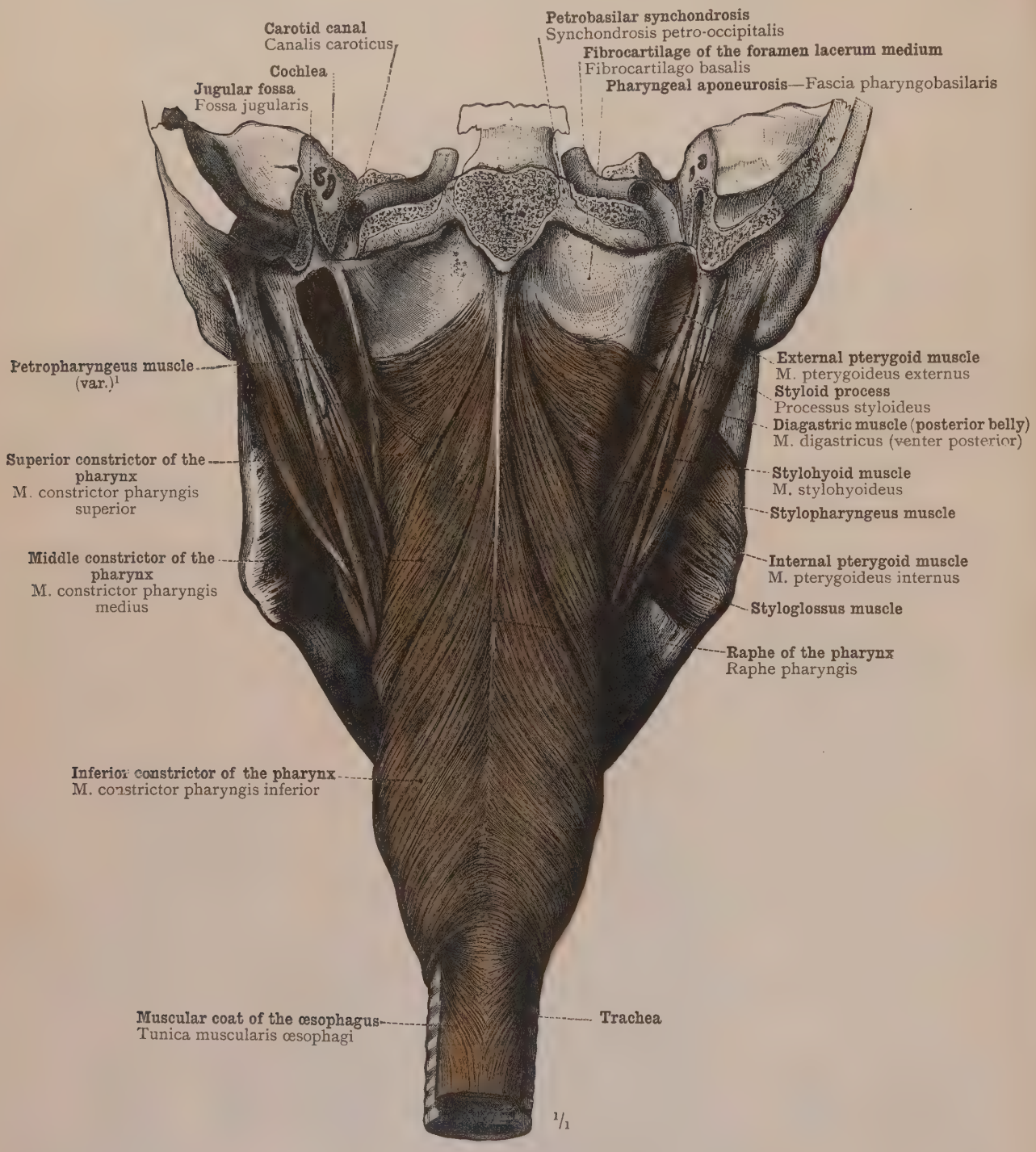
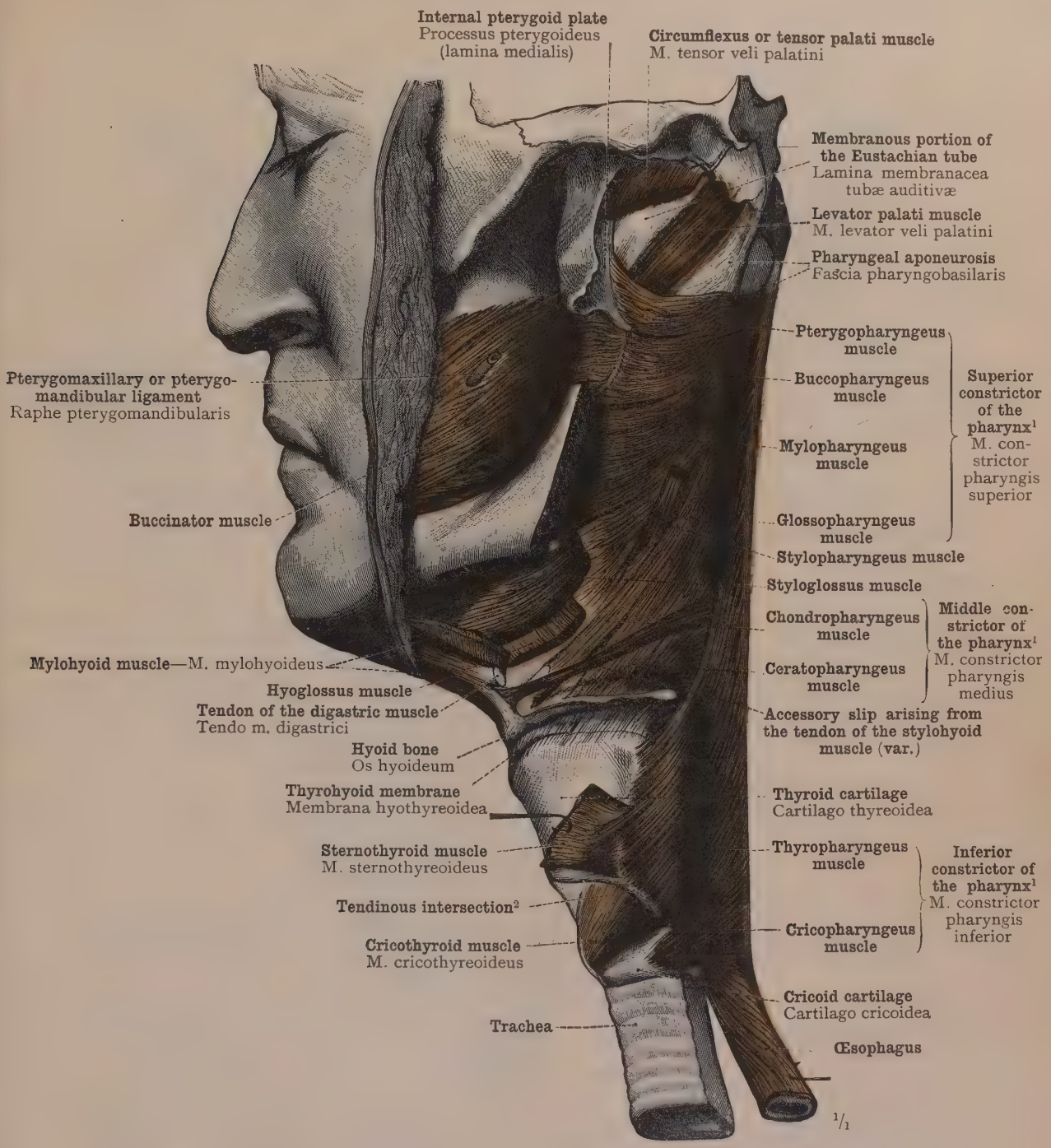


FIG. 705.—THE PHARYNX, AND ITS TRANSITION INTO THE ŒSOPHAGUS, SEEN FROM BEHIND. BY THE REMOVAL OF THE TUNICA ADVENTITIA PHARYNGIS,[2] THE OUTER MUSCULAR LAYER OF THE PHARYNX HAS BEEN LAID BARE: MUSCULI CONSTRICTORES PHARYNGIS, SUPERIOR, MEDIUS, ET INFERIUS; THE SUPERIOR, MIDDLE, AND INFERIOR CONSTRICTORS OF THE PHARYNX. THE MUSCLES ARISING FROM THE STYLOID PROCESS, AND THE POSTERIOR BELLY OF THE DIGASTRIC MUSCLE. THE PHARYNGEAL APONEUROSIS.

[1] *Petropharyngeus Muscle.*—This, the commonest of the supernumerary elevators of the pharynx, arises from the under surface of the petrous bone in front of the carotid canal, or from the vaginal process of the temporal bone. Others, less often met with, are the *sphenopharyngeus*, arising from the spine of the sphenoid; *petropharyngeus externus*, arising from the hamular process; *occipitopharyngeus*, arising from the basilar process; and the *mastopharyngeus* (very rare), arising from the mastoid process. They are inserted variably into one or other of the constrictors, or, passing between these muscles, directly into the fibrous layer of the pharynx (pharyngeal aponeurosis). Another occasional accessory slip is the *azygos pharyngis*, passing from the pharyngeal tubercle of the occipital bone to the raphe or to the posterior wall of the pharynx.—TR.

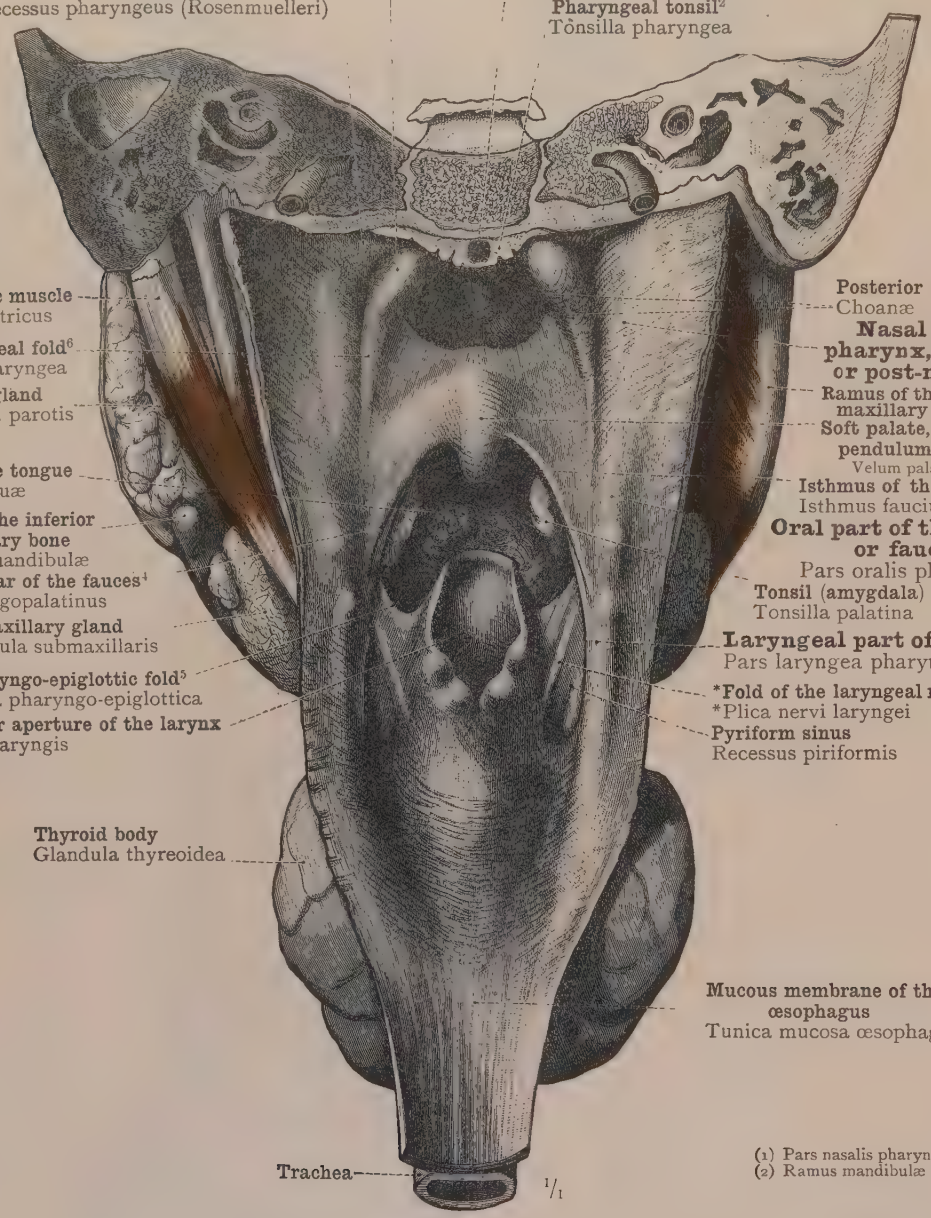
[2] See note [1] to p. 466.



[1] *Constrictors of the Pharynx.*—As the names given by the author to the different portions of these muscles are not often used in England, it seems expedient to explain their signification. Of the *superior constrictor:* the *pterygopharyngeus* is that portion which arises from the lower third of the hinder edge of the internal pterygoid plate and from the hamular process; the *buccopharyngeus* is that portion which arises from the pterygomaxillary ligament, by means of which it is connected with the origin of the buccinator muscle; the *mylopharyngeus* is that portion which arises from the posterior fifth of the internal oblique line or mylohyoid ridge of the inferior maxillary bone; and the *glossopharyngeus* is that portion which arises from the side of the tongue. Of the *middle constrictor:* the *chondropharyngeus* is that portion which arises from the small cornu of the hyoid bone and the stylohyoid ligament; and the *ceratopharyngeus* is that portion which arises from the great cornu of the hyoid bone. Of the *inferior constrictor:* the *thyropharyngeus* is that portion which arises from the inferior cornu, oblique line or ligament, and superior tubercle of the thyroid cartilage; and the *cricopharyngeus* is that portion which arises from a flat ridge on the side of the cricoid cartilage.—Tr.

[2] *Tendinous Intersection.*—Some of the superficial fibres of the cricothyroid muscle are almost always continuous with those of the inferior constrictor of the pharynx. Commonly, however, as here, a tendinous intersection across these fibres marks the boundary between the two muscles.—Tr.

FIG. 706.—OUTER MUSCULAR LAYER OF THE PHARYNX, LAID BARE ON THE LEFT SIDE, BY THE REMOVAL OF THE RAMUS OF THE INFERIOR MAXILLARY BONE, THE MUSCLES ARISING FROM THE STYLOID PROCESS, THE POSTERIOR BELLY OF THE DIGASTRIC MUSCLE, AND THE MYLOHYOID MUSCLE: MUSCULI CONSTRICTORES PHARYNGIS, THE THREE CONSTRICTORS OF THE PHARYNX, WITH THEIR VARIOUS SUBDIVISIONS (*see note* [1] *above*). CONNEXION OF THE BUCCINATOR MUSCLE WITH THE SUPERIOR CONSTRICTOR OF THE PHARYNX BY MEANS OF THE PTERYGOMAXILLARY OR PTERYGOMANDIBULAR LIGAMENT.



[1] The *pharyngeal bursa*, or *mesial recess of the pharynx*, is a flask-shaped pit in the mucous membrane, constant in the fœtus and the infant, and occasionally persistent in the adult. Its narrow orifice is on the posterior wall of the nasopharynx, immediately beneath the pharyngeal tonsil, and looks downwards and forwards. Widening within, the cavity passes upwards and then curves forwards through the substance of the pharyngeal tonsil, and terminates blindly in the median line immediately above the summit of the pharynx, its fundus being just below the pharyngeal tubercle.—Tr.

[2] See note [1] to p. 411.

[3] **Fold of the Laryngeal Nerve.*—"Within the pyriform sinus a fold of mucous membrane running obliquely downwards and inwards is occasionally to be seen. This fold is occupied by the superior laryngeal nerve, and is therefore called *plica nervi laryngei*—the *fold of the laryngeal nerve*."—Von Langer and Toldt's "Anatomy," 7th ed., p. 301.

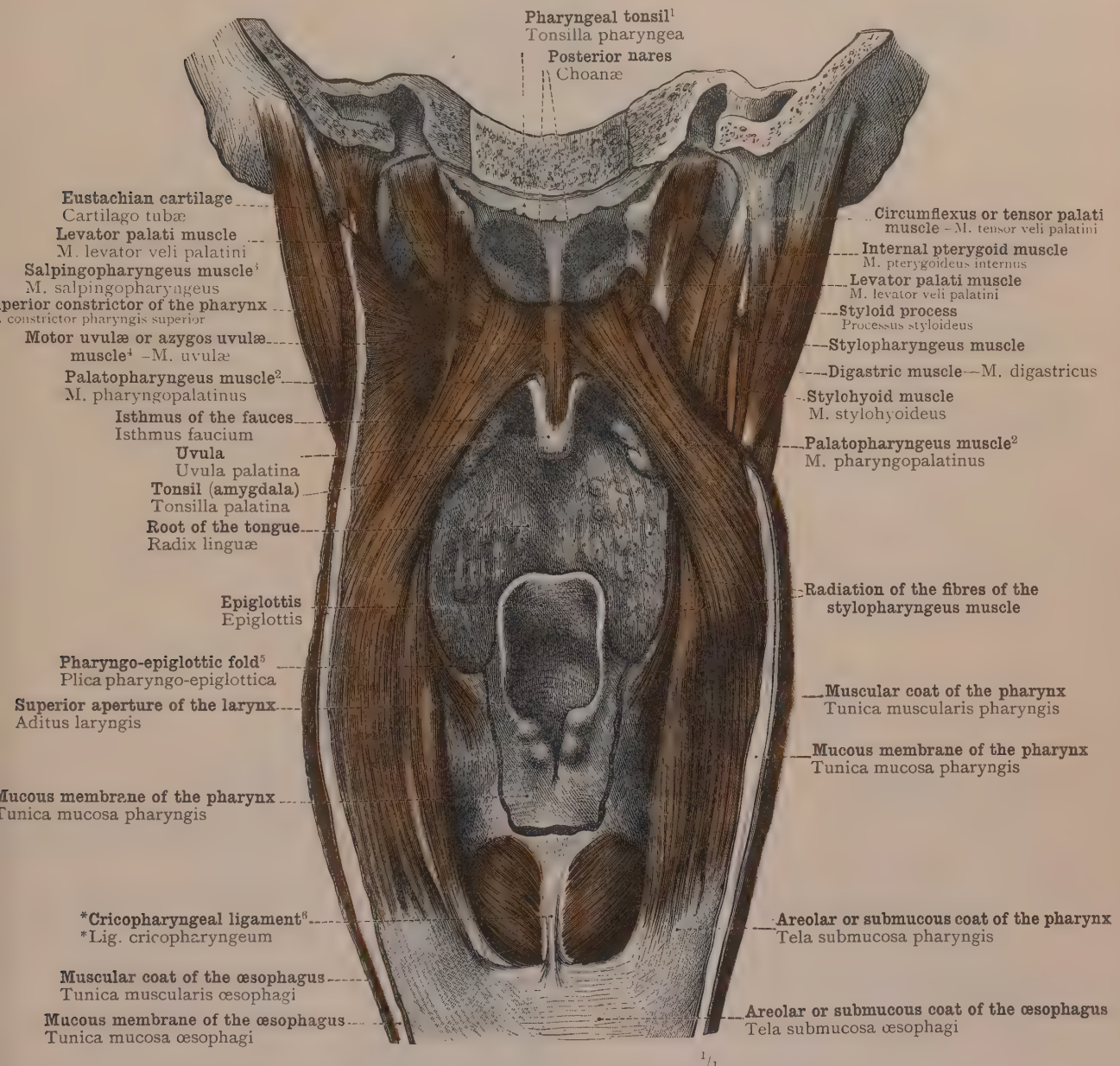
[4] Known also as the *posterior palatine*, or *pharyngopalatine, arch.*

[5] See note 7 to p. 415.

[6] See Appendix, note 4.

FIG. 707.—CAVUM PHARYNGIS, THE PHARYNGEAL CAVITY, SEEN FROM BEHIND. TUNICA MUCOSA PHARYNGIS, THE MUCOUS MEMBRANE OF THE PHARYNX. THE THREE DIVISIONS OF THE PHARYNX: PARS NASALIS PHARYNGIS, THE NASAL PART OF THE PHARYNX, NASOPHARYNX, OR POST-NASAL SPACE; PARS ORALIS PHARYNGIS, THE ORAL PART OF THE PHARYNX, OR FAUCES; PARS LARYNGEA PHARYNGIS, THE LARYNGEAL PART OF THE PHARYNX. THE OPENINGS INTO THE PHARYNGEAL CAVITY.

The posterior wall of the pharynx was divided throughout in the median line, separated from its attachments to the base of the skull, and then turned outwards on each side.



1/1

[1] See note [1] to p. 411. [2] See note [1] to p. 417.

[3] *Salpingopharyngeus Muscle.*—This consists of a few slender fasciculi which descend from the lower and anterior part of the Eustachian cartilage to the wall of the pharynx. It is usually regarded as an accessory portion of the palatopharyngeus muscle.—Tr.

[4] See note [1] to p. 418. [5] See note [7] to p. 415. [6] See Fig. 771, p. 459, and note [1] on same page.

FIG. 708.—MUSCLES OF THE SOFT PALATE (VELUM PENDULUM PALATI), AND THE VERTICAL MUSCLES (ELEVATORS) OF THE PHARYNX, DISPLAYED BY OPENING THE PHARYNX FROM BEHIND BY A MEDIAN LONGITUDINAL INCISION AND REMOVING THE MUCOUS MEMBRANE.

On the right side, the levator palati muscle and a small portion of the wall of the pharynx have been removed, in order to display the circumflexus or tensor palati muscle and a great part of the stylopharyngeus muscle. In the immediate neighbourhood of the superior aperture of the larynx (aditus laryngis), the mucous membrane of the pharynx has not been removed : also along the borders of the median longitudinal incision a narrow strip of the mucous membrane has been left.

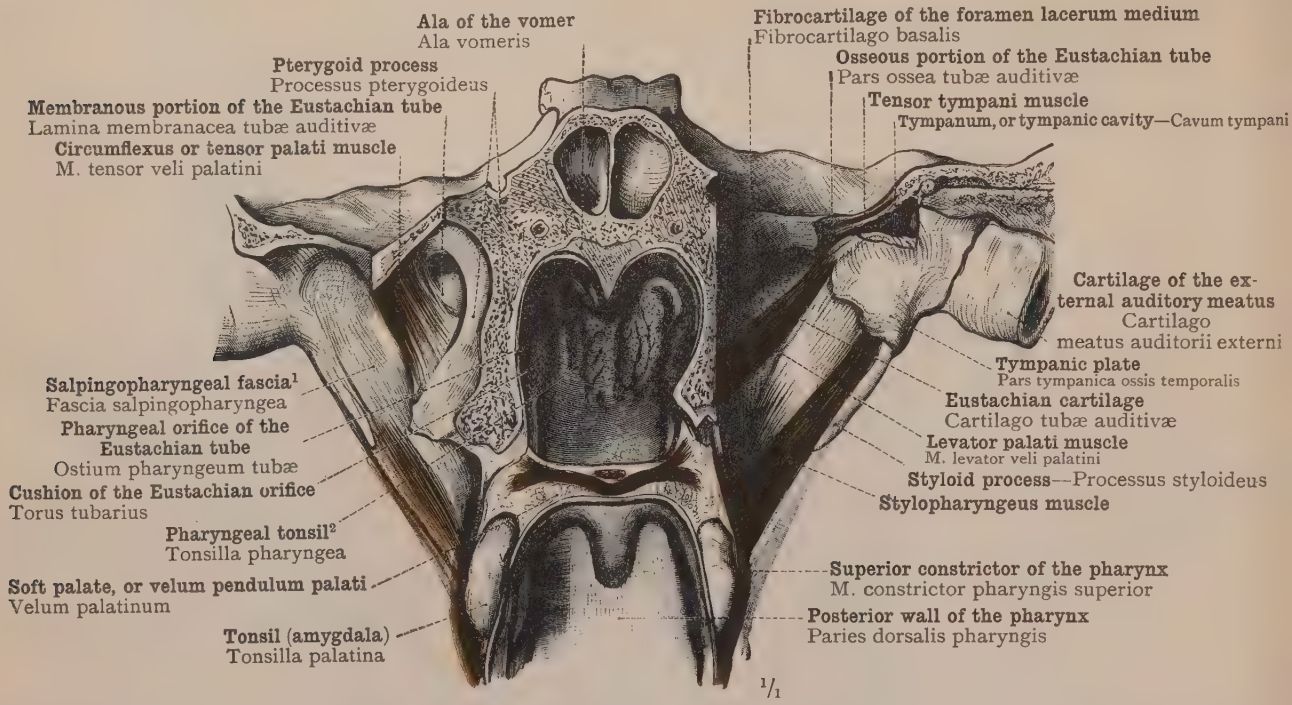


FIG. 709.—PARS NASALIS PHARYNGIS, THE NASAL PART OF THE PHARYNX, NASOPHARYNX, OR POST-NASAL SPACE, SEEN FROM BEFORE. CORONAL SECTION THROUGH THE HEAD. TONSILLA PHARYNGEA, THE PHARYNGEAL TONSIL.

On the left side, the greater part of the pterygoid process, the anterior wall of the tympanum, and the outer wall of the Eustachian tube, have been removed.

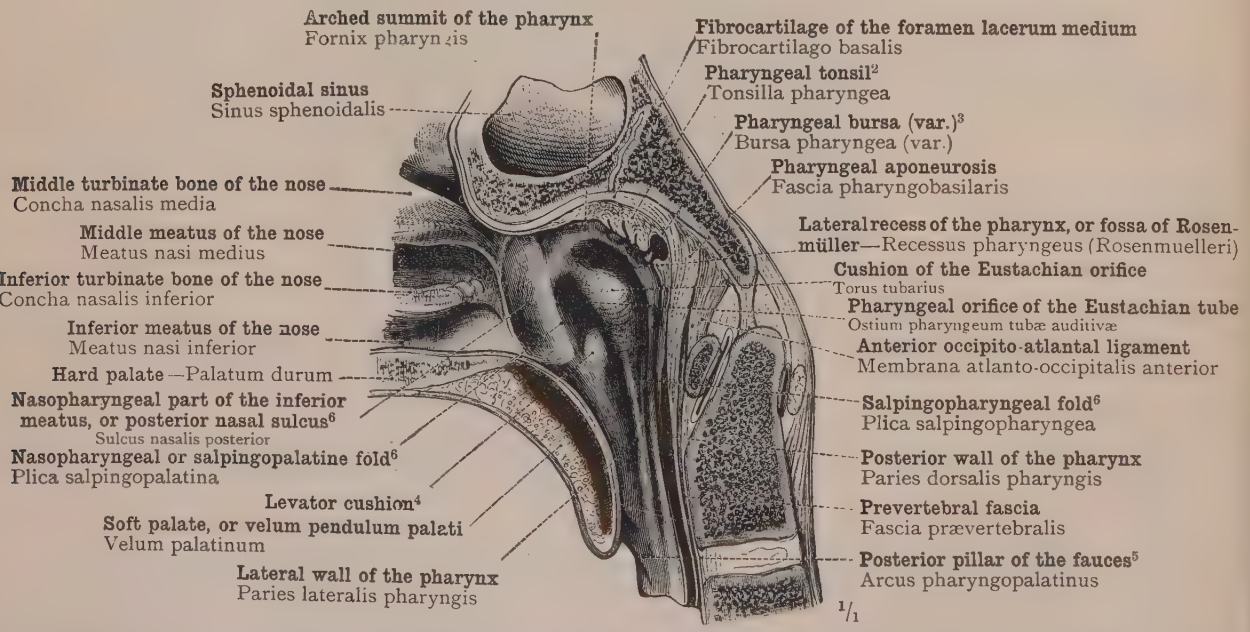


FIG. 710.—PARS NASALIS PHARYNGIS, THE NASAL PART OF THE PHARYNX, NASOPHARYNX, OR POST-NASAL SPACE, AND ITS CONNEXION WITH THE NASAL FOSSÆ, IN MEDIAN SAGITTAL SECTION. VIEW OF THE RIGHT LATERAL WALL OF THE NASOPHARYNX, WITH THE PHARYNGEAL ORIFICE OF THE EUSTACHIAN TUBE. TONSILLA PHARYNGEA, THE PHARYNGEAL TONSIL; BURSA PHARYNGEA, THE PHARYNGEAL BURSA. SULCUS NASALIS POSTERIOR, THE NASOPHARYNGEAL PART OF THE INFERIOR MEATUS OF THE NOSE, OR *POSTERIOR NASAL SULCUS, CORRESPONDING TO THE NASOPHARYNGEAL MEATUS (*see Part I., p.* 90, *Fig.* 203); PLICA SALPINGOPALATINA, THE NASOPHARYNGEAL OR SALPINGOPALATINE FOLD; PLICA SALPINGOPHARYNGEA, THE SALPINGOPHARYNGEAL FOLD.[4]

[1] *Salpingopharyngeal Fascia.*—Quain applies this name to the membranous portion of the Eustachian tube itself, but the author uses it to denote strands of fibrous tissue passing from the Eustachian cartilage to the submucous areolar tissue of the pharynx.—TR.

[2] See note [1] to p. 411. [3] See note [1] to p. 434.

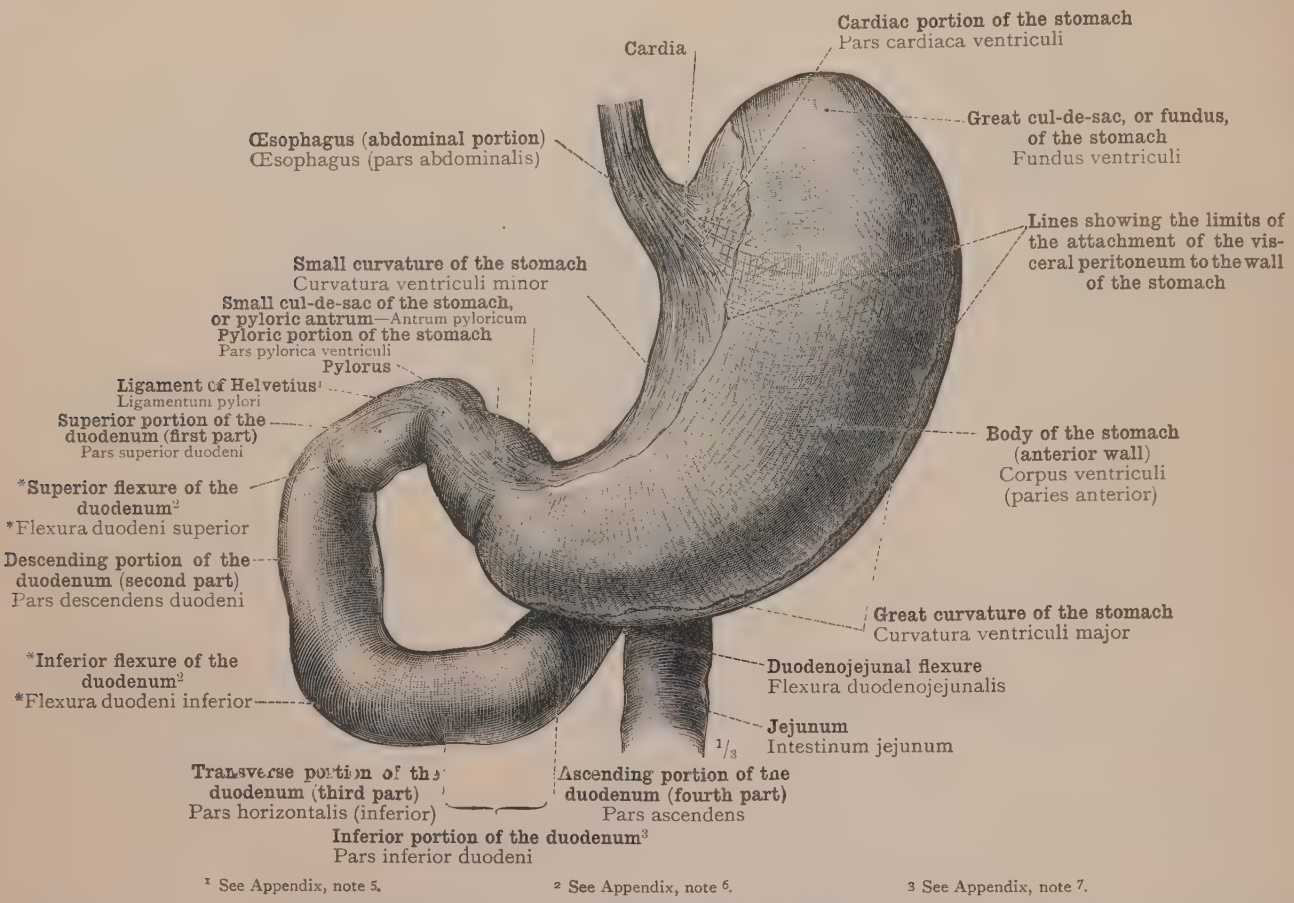
[4] —"When the levatores palati are contracted, the upper surface of the soft palate presents a convex eminence behind each posterior naris, called the *levator cushion.* This is occasionally seen in the dead body."—Quain's "Anatomy," vol. iii., part iv., p. 57. See also Appendix, note 4.

[5] Known also as the *posterior palatine*, or *pharyngopalatine, arch.* [6] See Appendix, note 4.

ABDOMINAL AND PELVIC PORTIONS

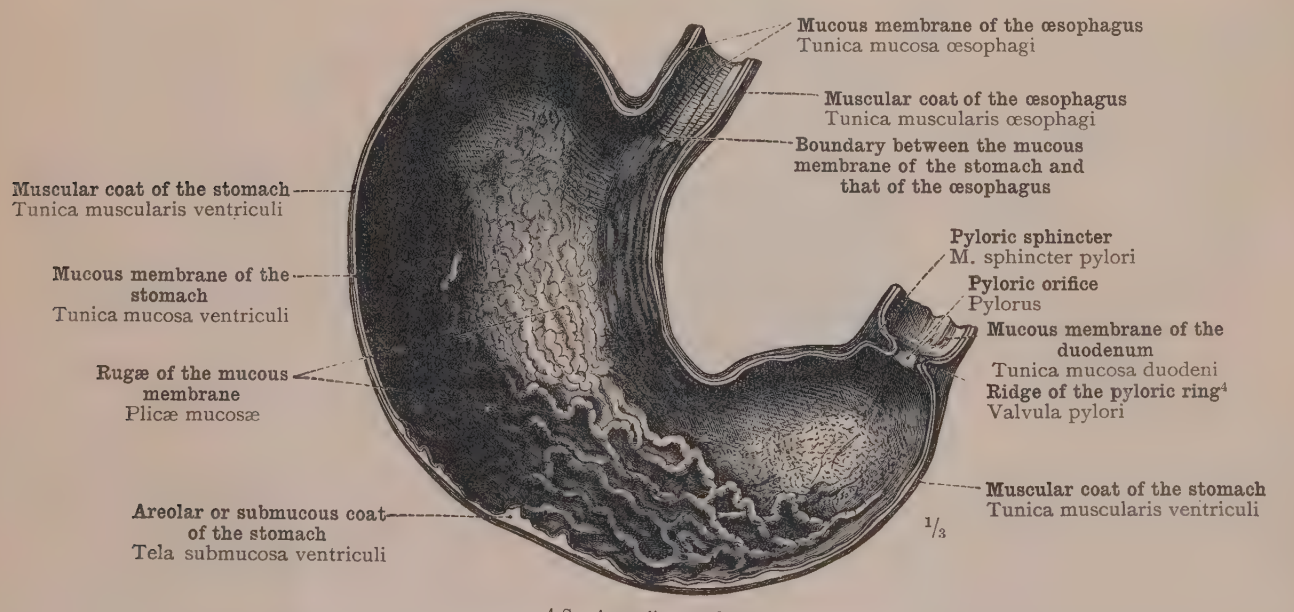
OF THE

DIGESTIVE ORGANS


Cardiac portion of the stomach
Pars cardiaca ventriculi
Cardia
Œsophagus (abdominal portion)
Œsophagus (pars abdominalis)
Great cul-de-sac, or fundus, of the stomach
Fundus ventriculi
Lines showing the limits of the attachment of the visceral peritoneum to the wall of the stomach
Small curvature of the stomach
Curvatura ventriculi minor
Small cul-de-sac of the stomach, or pyloric antrum—Antrum pyloricum
Pyloric portion of the stomach
Pars pylorica ventriculi
Pylorus
Ligament of Helvetius[1]
Ligamentum pylori
Superior portion of the duodenum (first part)
Pars superior duodeni
Body of the stomach (anterior wall)
Corpus ventriculi (paries anterior)
*Superior flexure of the duodenum[2]
*Flexura duodeni superior
Descending portion of the duodenum (second part)
Pars descendens duodeni
Great curvature of the stomach
Curvatura ventriculi major
*Inferior flexure of the duodenum[2]
*Flexura duodeni inferior
Duodenojejunal flexure
Flexura duodenojejunalis
Jejunum
Intestinum jejunum
1/3
Transverse portion of the duodenum (third part)
Pars horizontalis (inferior)
Ascending portion of the duodenum (fourth part)
Pars ascendens
Inferior portion of the duodenum[3]
Pars inferior duodeni

[1] See Appendix, note 5. [2] See Appendix, note 6. [3] See Appendix, note 7.

FIG. 711.—VENTRICULUS, THE STOMACH, MODERATELY DISTENDED, WITH THE LOWEST PORTION OF THE ŒSOPHAGUS, AND THE DUODENUM. SEEN FROM BEFORE.



[4] See Appendix, note 8.

FIG. 712.—ANTERIOR HALF OF THE STOMACH, WHICH HAS BEEN DIVIDED IN TWO BY INCISIONS ALONG THE GREAT AND SMALL CURVATURES; SEEN FROM THE INSIDE. TRANSITION OF THE MUCOUS MEMBRANE OF THE ŒSOPHAGUS INTO THAT OF THE CARDIA. PYLORUS, OR PYLORIC ORIFICE. PLICÆ MUCOSÆ VENTRICULI, RUGÆ OF THE MUCOUS MEMBRANE OF THE STOMACH.

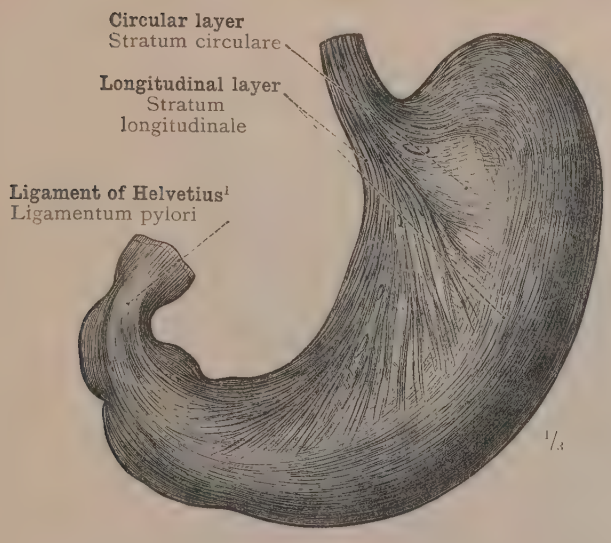
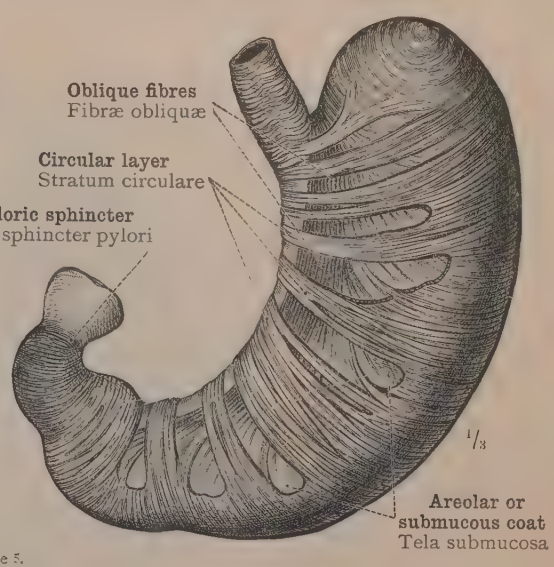


FIG. 713.—SUPERFICIAL LAYER OF THE MUSCULAR COAT OF THE STOMACH: LONGITUDINAL LAYER.



[1] See Appendix, note 5.

FIG. 714.—MIDDLE AND DEEP LAYERS OF THE MUSCULAR COAT OF THE STOMACH: CIRCULAR LAYER, AND OBLIQUE FIBRES.

Strips of the circular layer have been removed, in order to display the oblique fibres beneath.

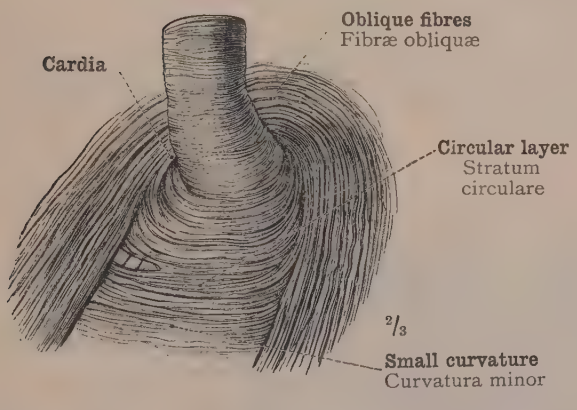


FIG. 715.—MUSCULAR COAT AT THE CARDIA, SEEN FROM WITHIN, THE MUCOUS MEMBRANE HAVING BEEN REMOVED.

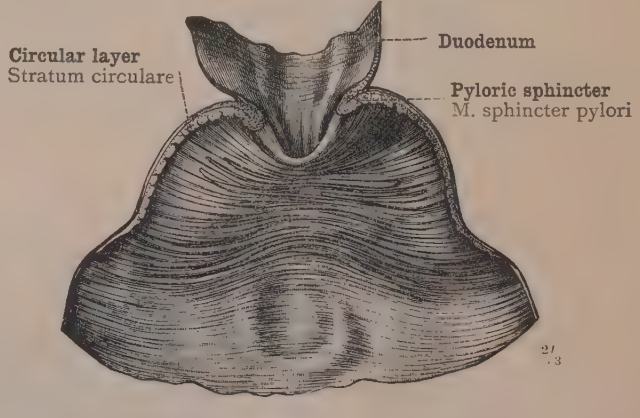


FIG. 716.—MUSCULAR COAT IN THE PYLORIC REGION, LAID BARE FROM WITHIN.

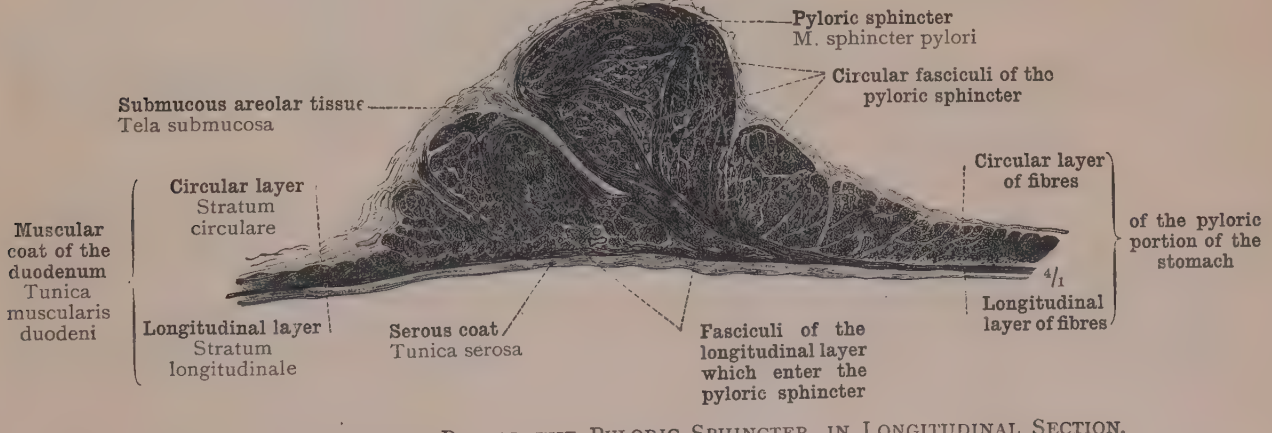


FIG. 717.—M. SPHINCTER PYLORI, THE PYLORIC SPHINCTER, IN LONGITUDINAL SECTION.

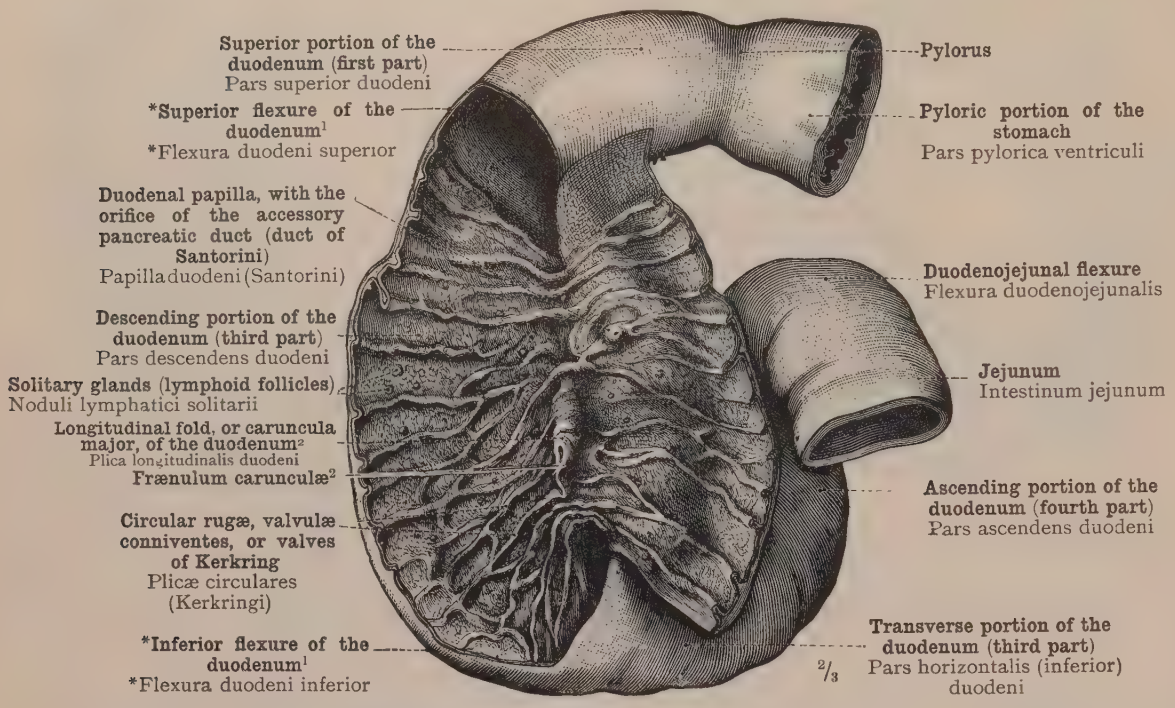

Superior portion of the duodenum (first part)
Pars superior duodeni
*Superior flexure of the duodenum[1]
*Flexura duodeni superior
Duodenal papilla, with the orifice of the accessory pancreatic duct (duct of Santorini)
Papilla duodeni (Santorini)
Descending portion of the duodenum (third part)
Pars descendens duodeni
Solitary glands (lymphoid follicles)
Noduli lymphatici solitarii
Longitudinal fold, or caruncula major, of the duodenum[2]
Plica longitudinalis duodeni
Frænulum caruncuæ[2]
Circular rugæ, valvulæ conniventes, or valves of Kerkring
Plicæ circulares (Kerkringi)
*Inferior flexure of the duodenum[1]
*Flexura duodeni inferior
Pylorus
Pyloric portion of the stomach
Pars pylorica ventriculi
Duodenojejunal flexure
Flexura duodenojejunalis
Jejunum
Intestinum jejunum
Ascending portion of the duodenum (fourth part)
Pars ascendens duodeni
Transverse portion of the duodenum (third part)
Pars horizontalis (inferior) duodeni
2/3

FIG. 718.—DUODENUM, SEEN FROM BEFORE. THE DESCENDING PORTION HAS BEEN OPENED, AND THE ANTERIOR WALL TURNED TO THE LEFT. PLICA LONGITUDINALIS DUODENI, THE LONGITUDINAL FOLD, OR CARUNCULA MAJOR, OF THE DUODENUM, AT THE LOWER END OF WHICH IS THE ORIFICE OF THE DUODENAL DIVERTICULUM, DIVERTICULUM DUODENALE (VATERI).[2] PAPILLA DUODENI, THE DUODENAL PAPILLA, WITH THE ORIFICE OF THE ACCESSORY PANCREATIC DUCT, OR DUCT OF SANTORINI.

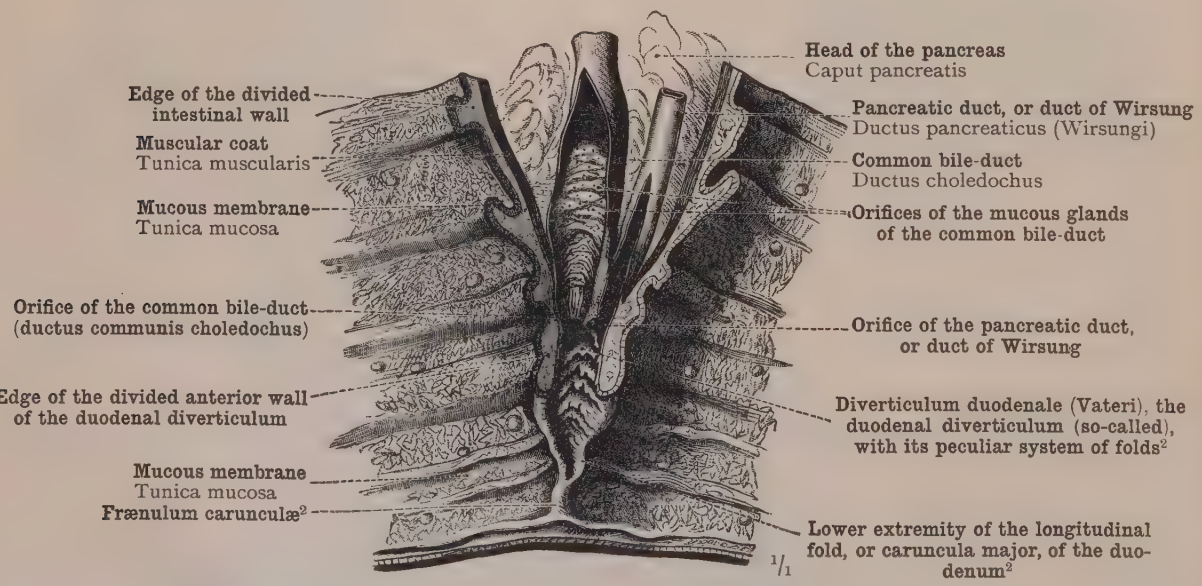

Edge of the divided intestinal wall
Muscular coat
Tunica muscularis
Mucous membrane
Tunica mucosa
Orifice of the common bile-duct (ductus communis choledochus)
Edge of the divided anterior wall of the duodenal diverticulum
Mucous membrane
Tunica mucosa
Frænulum caruncuæ[2]
Head of the pancreas
Caput pancreatis
Pancreatic duct, or duct of Wirsung
Ductus pancreaticus (Wirsungi)
Common bile-duct
Ductus choledochus
Orifices of the mucous glands of the common bile-duct
Orifice of the pancreatic duct, or duct of Wirsung
Diverticulum duodenale (Vateri), the duodenal diverticulum (so-called), with its peculiar system of folds[2]
Lower extremity of the longitudinal fold, or caruncula major, of the duodenum[2]
1/1

FIG. 719.—THE DUODENUM HAVING BEEN EXCISED, A LONGITUDINAL INCISION HAS BEEN MADE INTO THE SAC-LIKE DILATATION, DIVERTICULUM DUODENALE (VATERI),[2] TO SHOW THE IMBRICATED TRANSVERSE FOLDS[3] IN ITS INTERIOR. LONGITUDINAL INCISIONS HAVE ALSO BEEN MADE INTO THE LOWER EXTREMITIES OF THE COMMON BILE-DUCT AND THE PANCREATIC DUCT, OR DUCT OF WIRSUNG, WHICH OPEN INTO THE DUODENAL DIVERTICULUM.

[1] See Appendix, note 6. [2] See Appendix, note 9. [3] See Appendix, note 10.

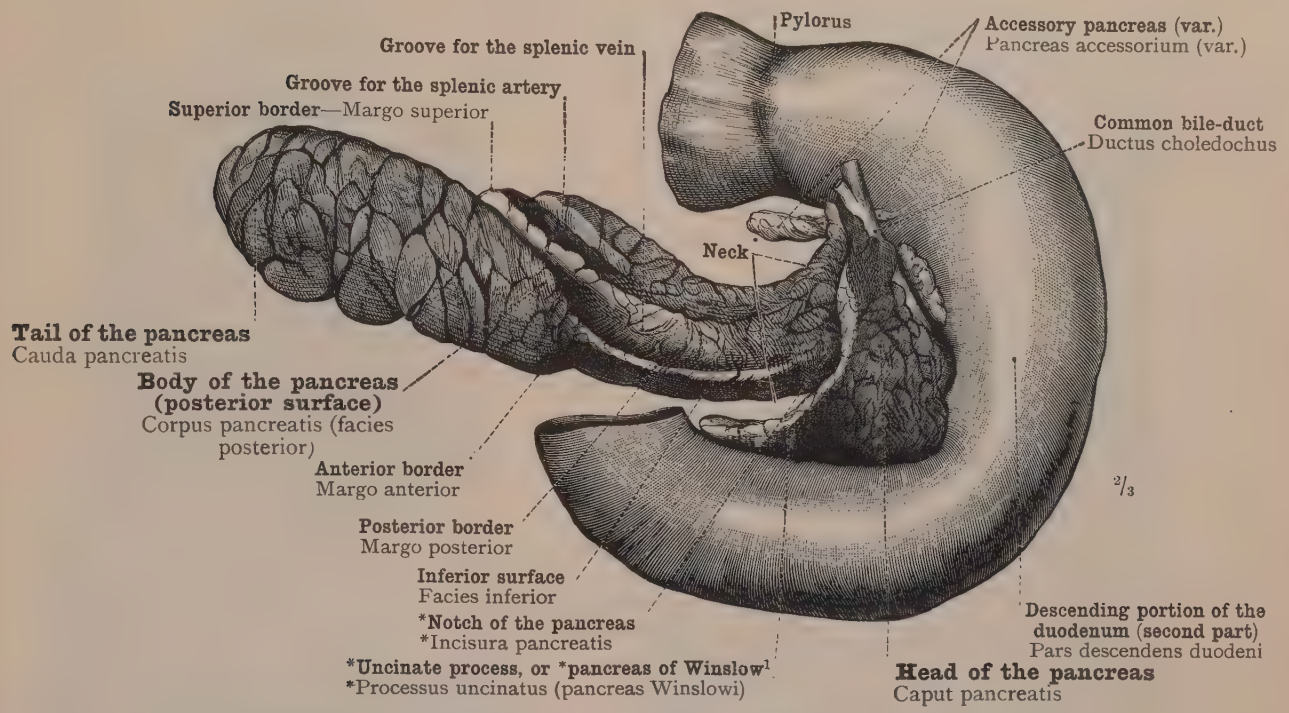


FIG. 720.—THE PANCREAS; ITS RELATIONS TO THE DUODENUM AND TO THE COMMON BILE-DUCT. ACCESSORY PANCREAS. SEEN FROM BEHIND.

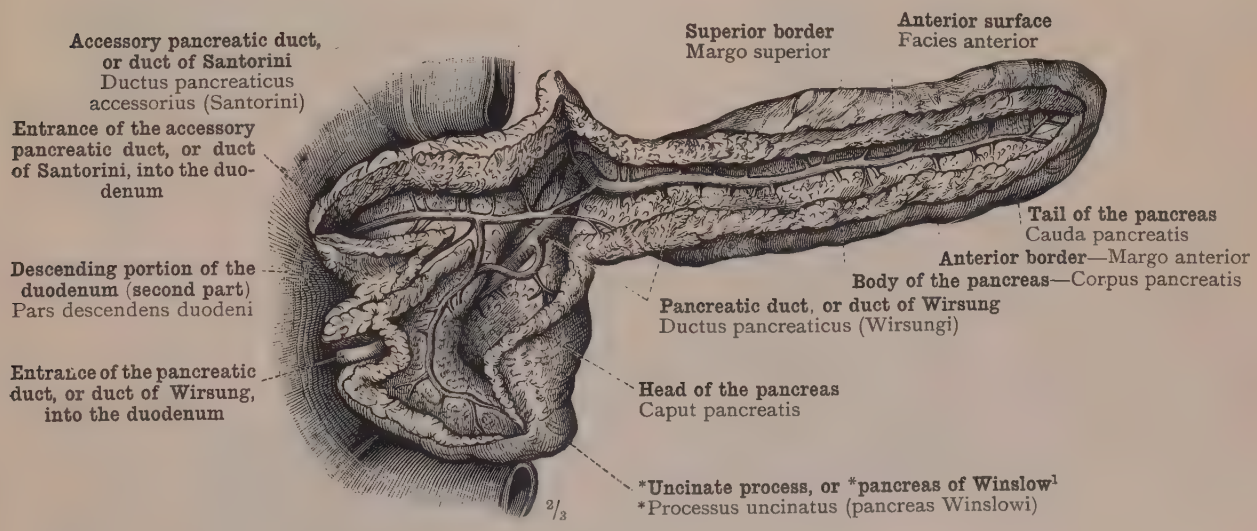

Accessory pancreatic duct, or duct of Santorini
Ductus pancreaticus accessorius (Santorini)
Entrance of the accessory pancreatic duct, or duct of Santorini, into the duodenum
Superior border
Margo superior
Anterior surface
Facies anterior
Tail of the pancreas
Cauda pancreatis
Anterior border—Margo anterior
Body of the pancreas—Corpus pancreatis
Descending portion of the duodenum (second part)
Pars descendens duodeni
Pancreatic duct, or duct of Wirsung
Ductus pancreaticus (Wirsungi)
Entrance of the pancreatic duct, or duct of Wirsung, into the duodenum
Head of the pancreas
Caput pancreatis
*Uncinate process, or *pancreas of Winslow[1]
*Processus uncinatus (pancreas Winslowi)
2/3

FIG. 721.—THE PANCREAS, WITH ITS DUCTS DISSECTED OUT, SEEN FROM BEFORE. PANCREATIC DUCT, OR DUCT OF WIRSUNG; ACCESSORY PANCREATIC DUCT, OR DUCT OF SANTORINI.

[1] That portion of the head of the pancreas which extends to the left in a hook-like manner behind the mesenteric vessels, called by the author the **uncinate process*, or **pancreas of Winslow*, is sometimes completely separate from the rest of the gland, and is then termed the *lesser pancreas*.—TR.

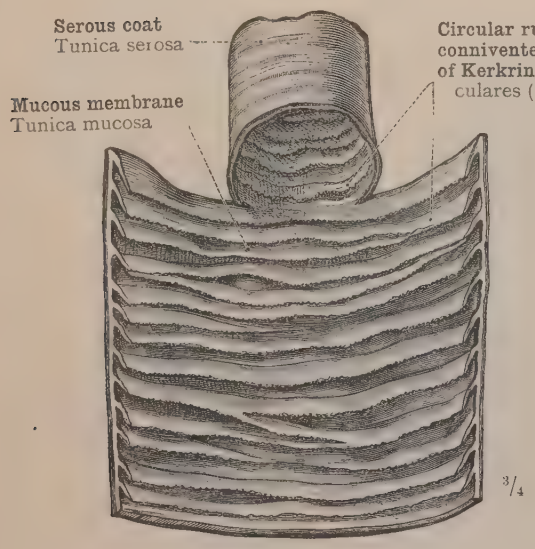


FIG. 722.—THE JEJUNUM, IN PART OPENED.

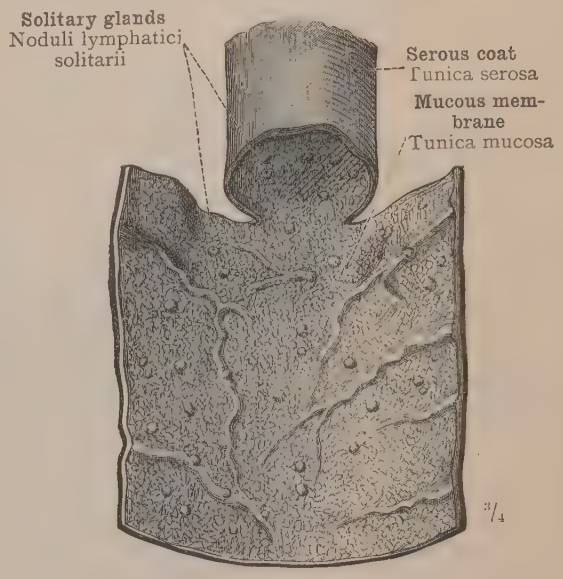
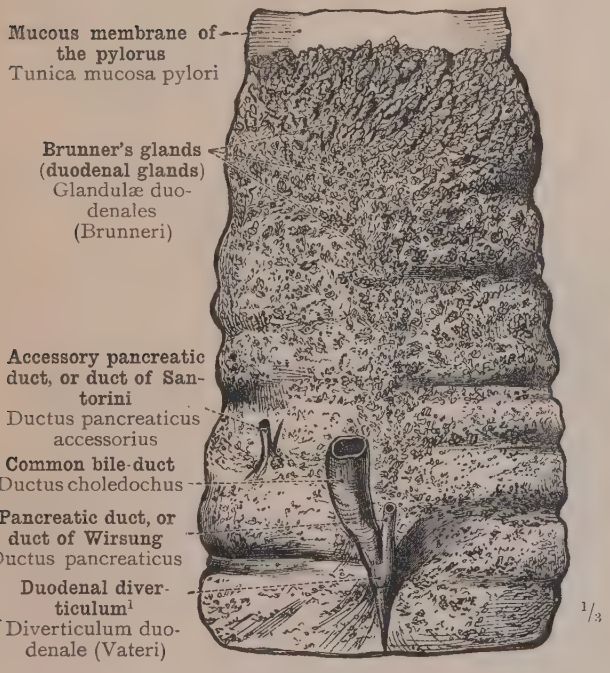


FIG. 723.—THE ILEUM, IN PART OPENED.

INTESTINUM TENUE—THE SMALL INTESTINE.



[1] See Appendix, note

FIG. 724.—OUTER SURFACE OF THE MUCOUS MEMBRANE OF THE DUODENUM, WITH BRUNNER'S GLANDS (DUODENAL GLANDS), DISPLAYED BY THE REMOVAL OF THE MUSCULAR COAT.

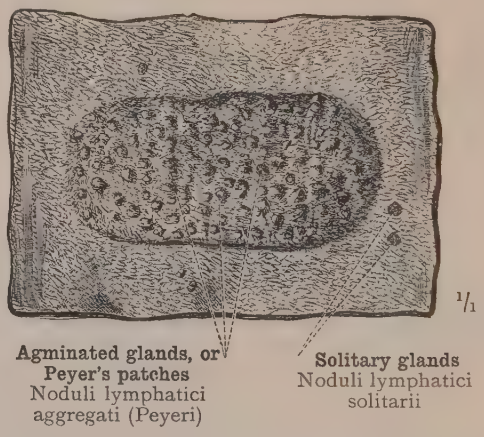


FIG. 725.—NODULI LYMPHATICI AGGREGATI, AGMINATED GLANDS, OR PEYER'S PATCHES, FROM THE ILEUM.

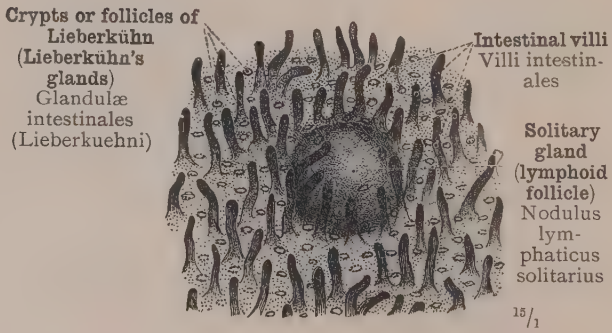


FIG. 726.—MUCOUS MEMBRANE OF THE ILEUM, WITH A SOLITARY GLAND (LYMPHOID FOLLICLE).

Tubus digestorius—Alimentary canal.

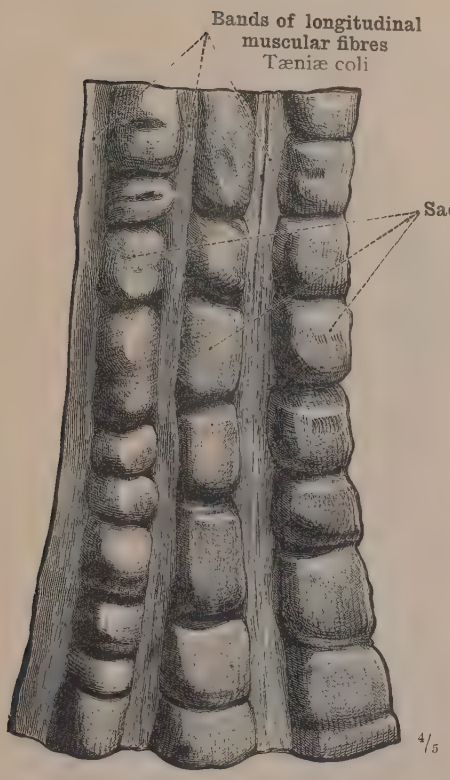


FIG. 727.—TUNICA MUSCULARIS, THE MUSCULAR COAT, OF THE OPENED LARGE INTESTINE (TRANSVERSE COLON), DISPLAYED FROM THE OUTER SIDE BY THE REMOVAL OF THE SEROUS COAT.

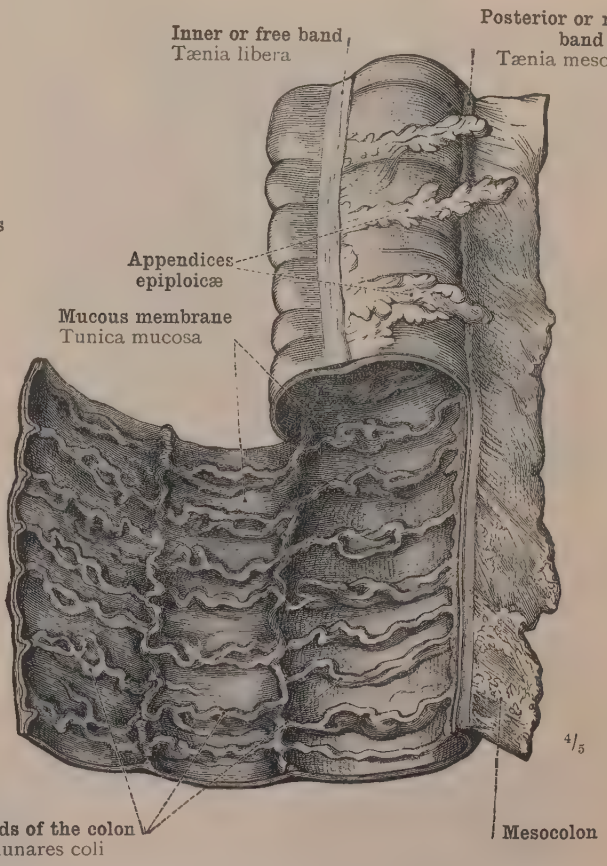


FIG. 728.—INTESTINUM CRASSUM, THE LARGE INTESTINE, IN PART OPENED ALONG THE LINE OF ATTACHMENT OF THE MESENTERY.

The piece of intestine is in the contracted state.

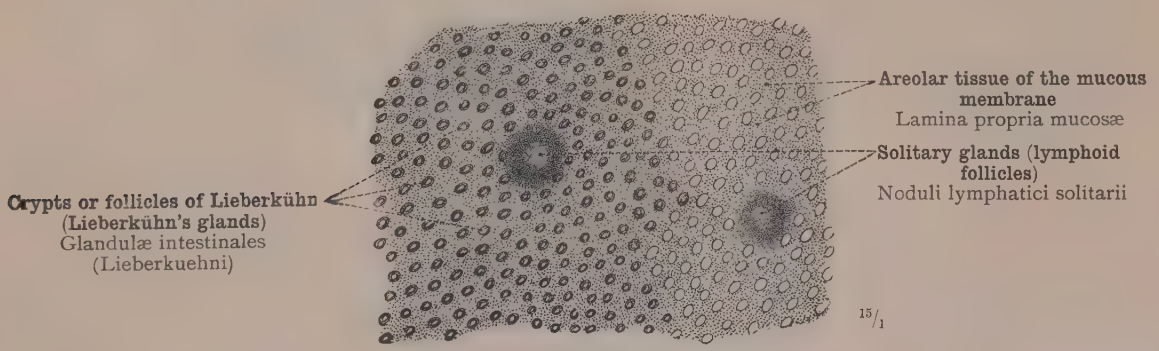


FIG. 729.—MUCOUS MEMBRANE OF THE LARGE INTESTINE (TRANSVERSE COLON), MODERATELY MAGNIFIED, SEEN FROM WITHIN.

On the right side of the preparation the gland cells of the crypts or follicles of Lieberkühn (glandulæ intestinales, Lieberkühn's glands) have been removed by gentle friction.

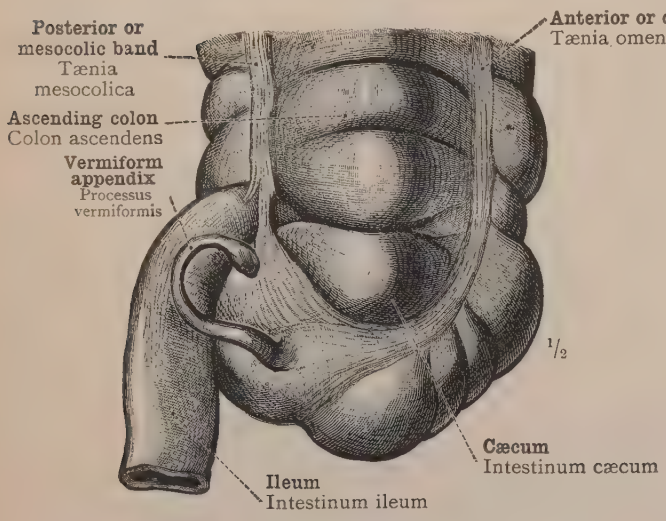


FIG. 730.—INTESTINUM CÆCUM, THE CÆCUM, IN THE DISTENDED STATE, SEEN FROM BEHIND, THE SEROUS COAT HAVING BEEN REMOVED.

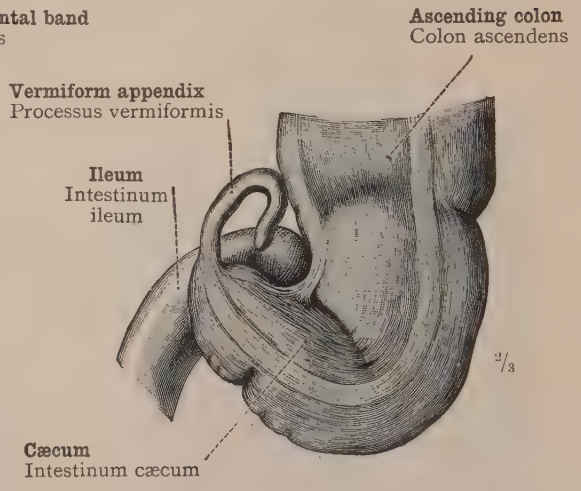


FIG. 731.—INTESTINUM CÆCUM, THE CÆCUM, OF AN ADULT MALE, IN THE FULLY-CONTRACTED STATE, SEEN FROM BEHIND, THE SEROUS COAT HAVING BEEN REMOVED.

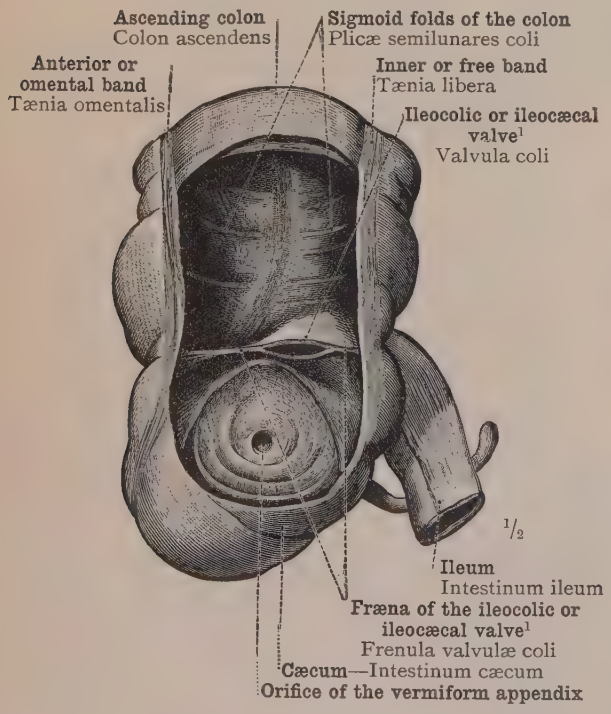


FIG. 732.—THE CÆCUM, DISTENDED AND DRIED, SEEN FROM THE OUTER SIDE.

A portion of the outer wall has been removed, in order to display the ileocolic or ileocæcal valve[1] and the orifice of the vermiform appendix.

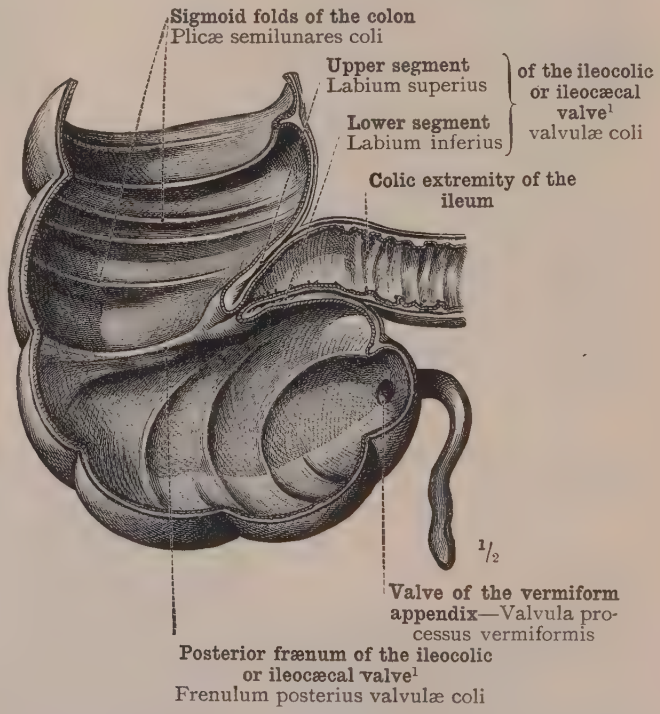


FIG. 733.—THE CÆCUM, HARDENED IN FORMALIN, AND DIVIDED BY AN INCISION PASSING THROUGH THE ILEOCOLIC OR ILEOCÆCAL ORIFICE. THE ILEOCOLIC OR ILEOCÆCAL VALVE[1] (VALVULA COLI) IS SEEN CLOSED, IN CORONAL SECTION.

[1] *Ileocolic or Ileocæcal Valve.*—This is known also as the *valve of Bauhin* and as the *valve of Tulpius*, but was described by Fallopius at an earlier date than by either of these anatomists. Macalister distinguishes the upper or colic lip or segment as the *ileocolic valve*, and the lower or cæcal lip or segment as the *ileocæcal valve*. The *fræna* or *retinacula* of the valve are prominent folds in front and behind the orifice formed by the union of the two segments; they pass round the gut to unite opposite the orifice, forming a shelf which separates the cæcum from the ascending colon. This shelf is sometimes called the *frænum of Morgagni*.—TR.

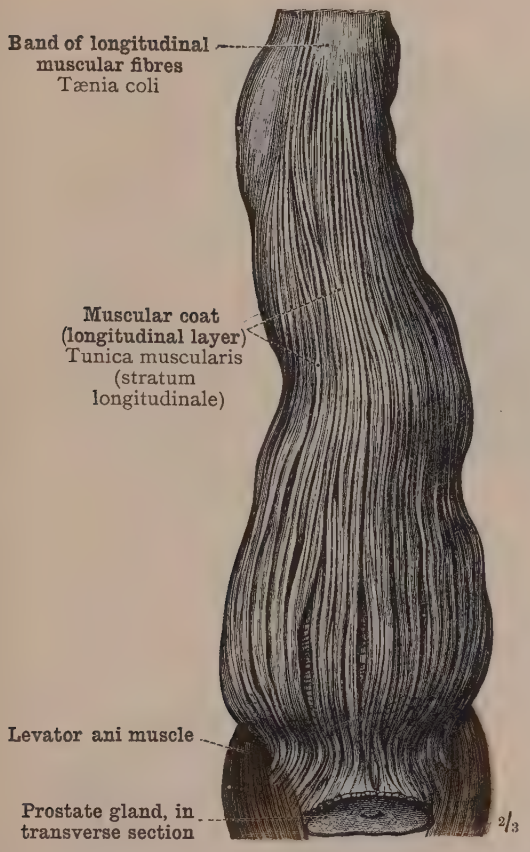


FIG. 734.—INTESTINUM RECTUM, THE RECTUM, THE LONGITUDINAL LAYER OF MUSCULAR FIBRES HAVING BEEN EXPOSED. SEEN FROM BEFORE.

Some of the longitudinal fibres are seen to pass on to the surface of the prostate gland, and others between the fasciculi of the levator ani muscle.

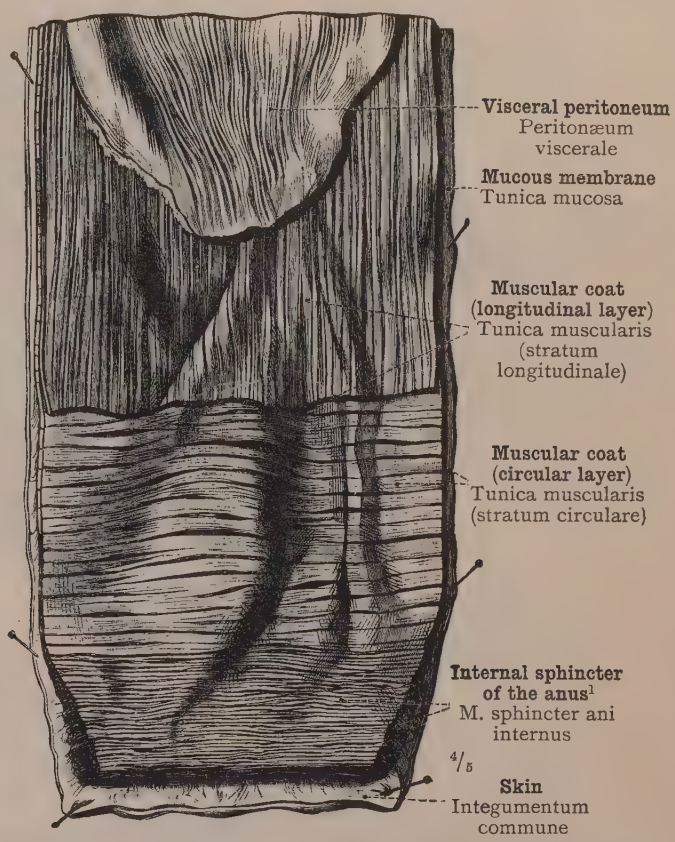


FIG. 735.—OUTER SURFACE OF THE RECTUM, WHICH HAS BEEN ISOLATED AND OPENED FROM BEHIND.

In the lower half the longitudinal layer of the muscular coat has been removed, in order to display the circular layer and the continuity of this latter with the internal or circular sphincter of the anus.

FIG. 736.—MUCOUS MEMBRANE OF THE LOWER PART OF THE RECTUM AND ITS CONTINUITY WITH THE SKIN.

[1] Known also as the *deep* or *circular sphincter of the anus*.
[2] See Appendix, note [11].
[3] See Appendix, note [12].
[4] Known also as the *deep* or *circular sphincter of the anus*.

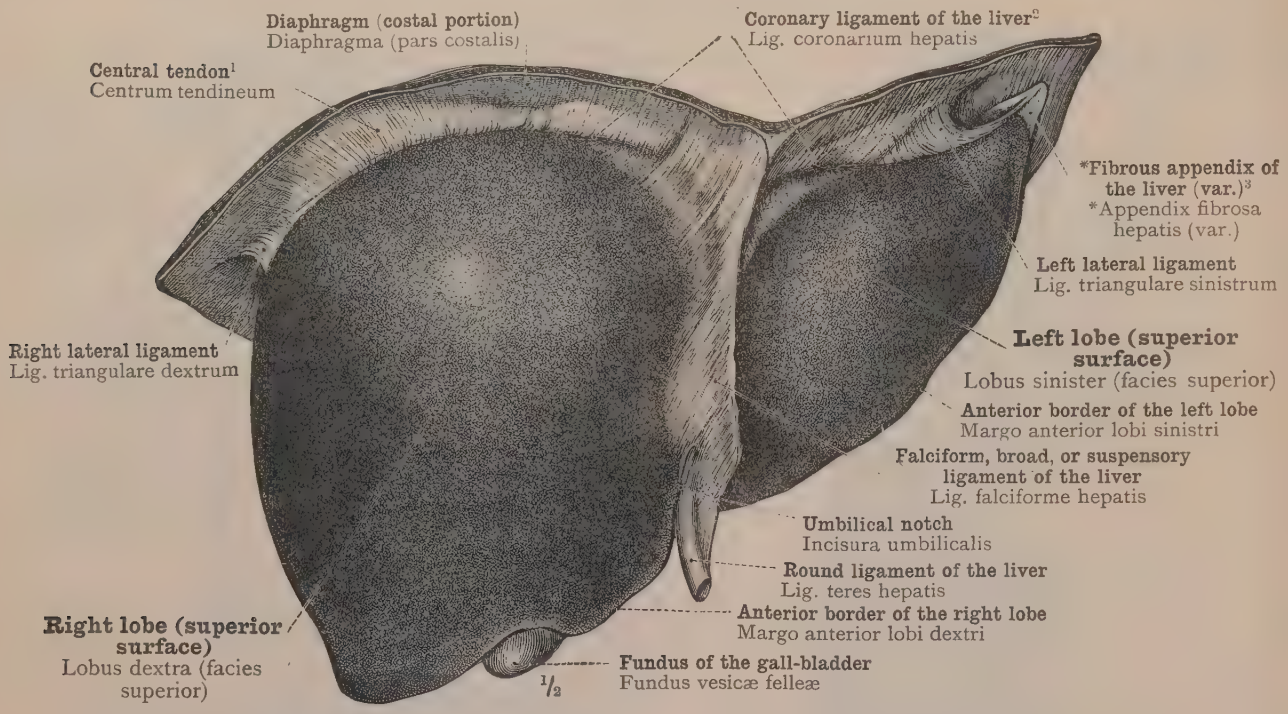


FIG. 737.—SUPERIOR SURFACE OF THE LIVER AND ITS ATTACHMENTS TO THE DIAPHRAGM.

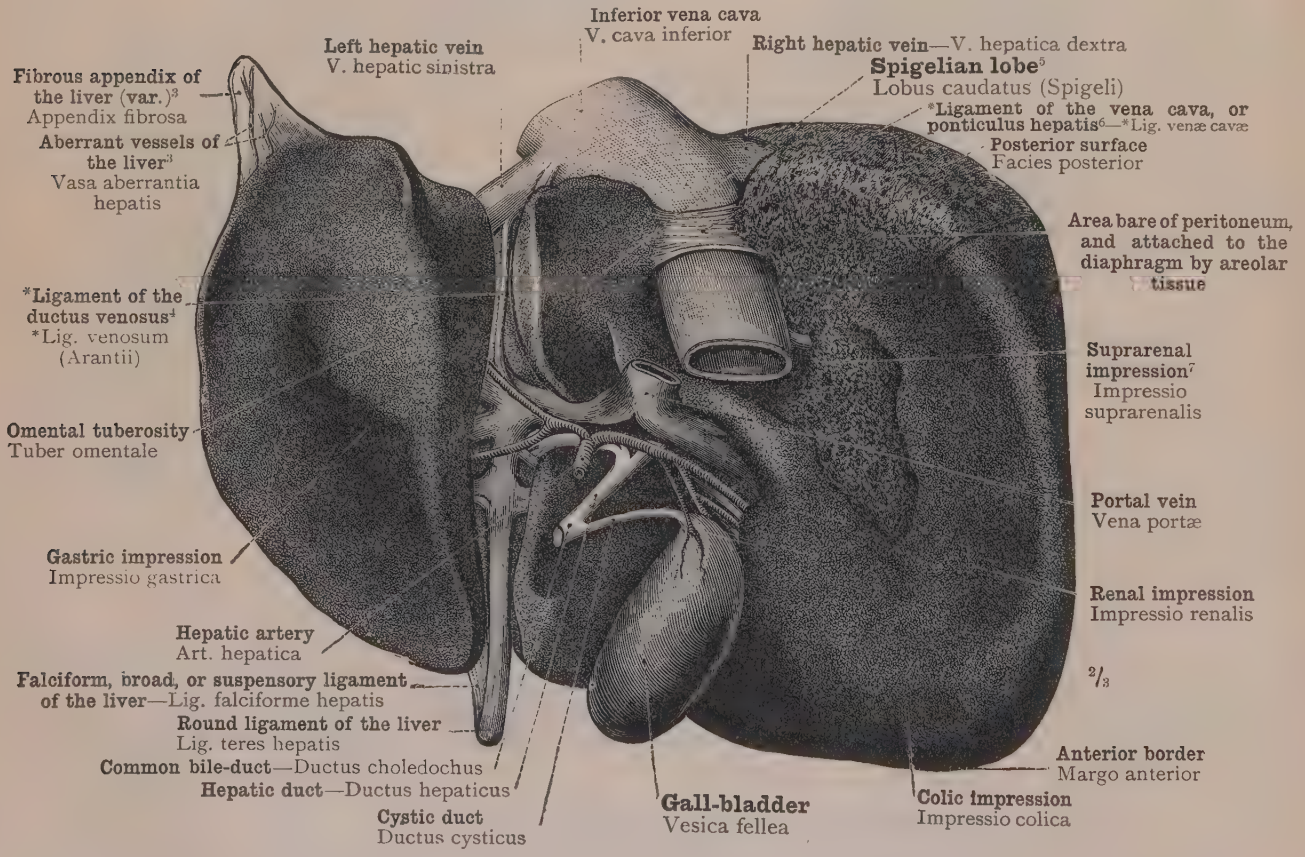


FIG. 738.—INFERIOR SURFACE OF THE LIVER; THE STRUCTURES OCCUPYING THE FISSURES OF THE ORGAN.

[1] Called also the *trefoil* or *cordiform tendon* of the diaphragm. [2] See Appendix, note 13.
[3] See Appendix, note 14. [4] See Appendix, note 15. [5] See Appendix, note 16.
[6] See Appendix, note 17. [7] Or *adrenal impression.*

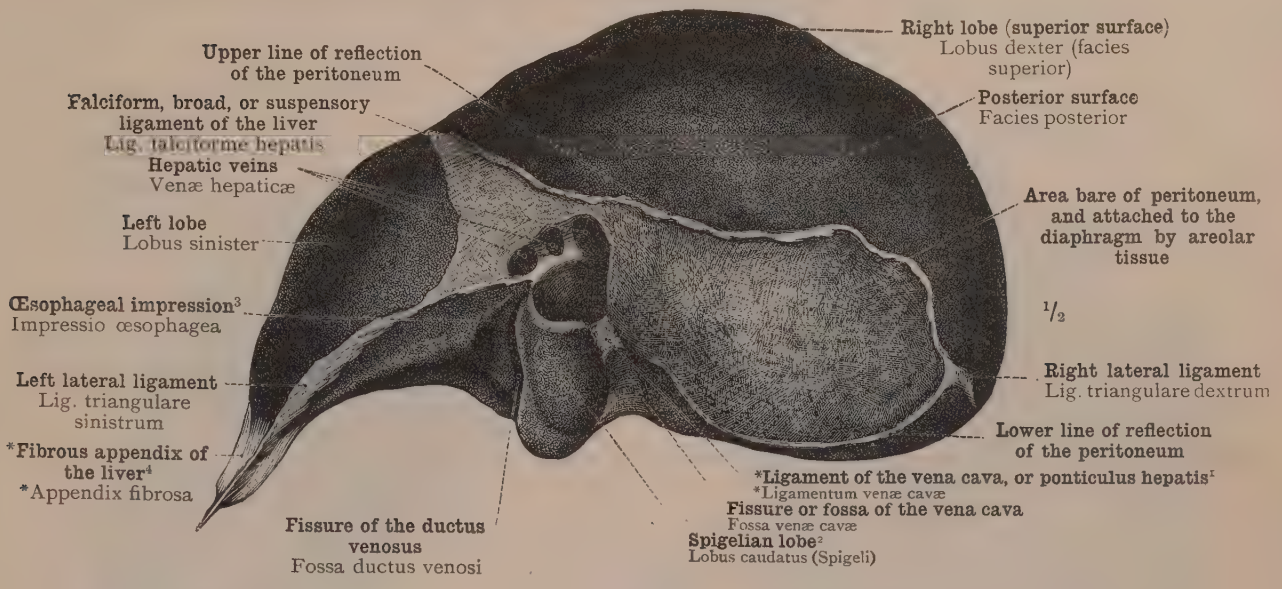


FIG. 739.—POSTERIOR SURFACE OF THE LIVER, WITH THE ORIFICES OF THE HEPATIC VEINS.

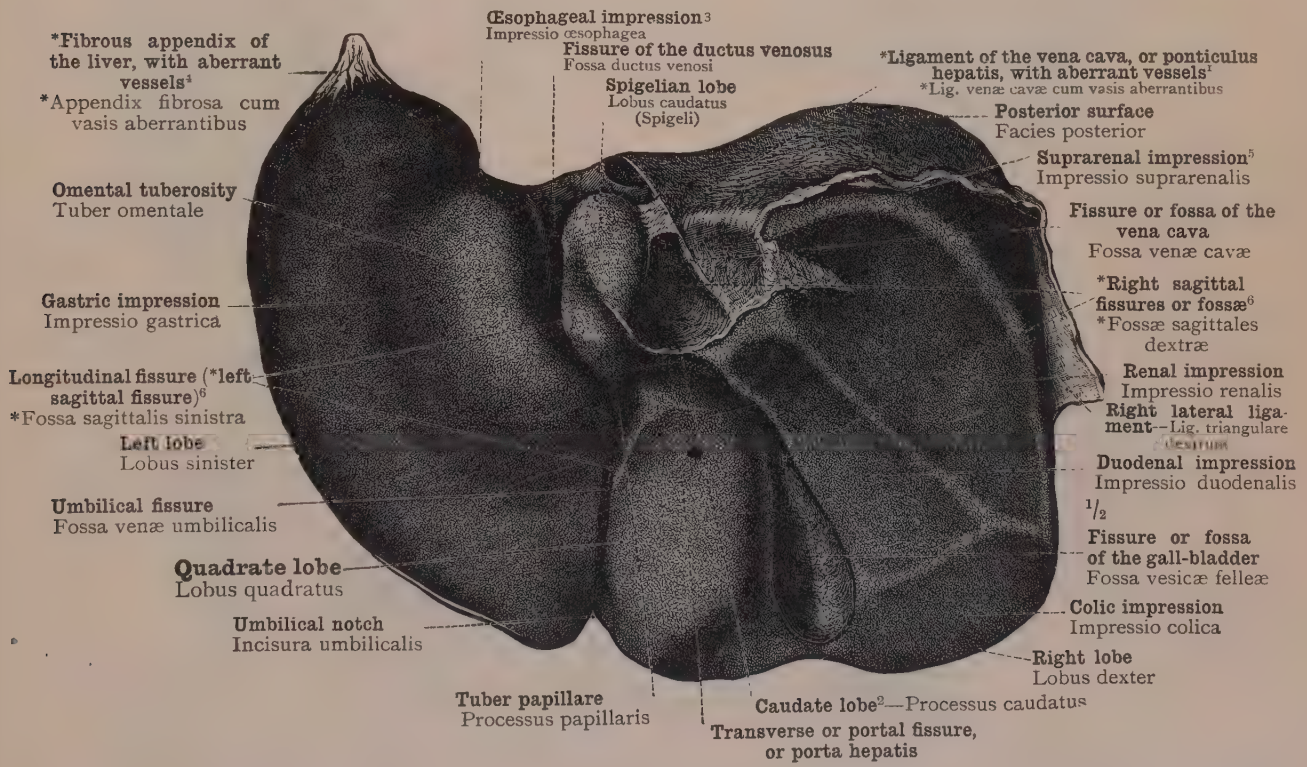


FIG. 740.—INFERIOR SURFACE OF A LIVER WHICH WAS HARDENED *IN SITU* BEFORE THE BODY WAS OPENED, THE STRUCTURES OCCUPYING THE FISSURES OF THE ORGAN HAVING BEEN ENTIRELY REMOVED.

[1] See Appendix, note 17. [2] See Appendix, note 16. [3] Known also as the *œsophageal groove* or *œsophageal sulcus.*
[4] See Appendix, note 14. [5] Or *adrenal impression.*
[6] *Sagittal Fissures.*—This name is not used in England. The *umbilical fissure* and the *fissure of the ductus venosus* form the anterior and posterior parts, respectively, of the *longitudinal fissure* of English anatomists, called by the author *fossæ sagittalis sinistra.* The *fissure* or *fossa of the gall-bladder* and the *fissure* or *fossa of the vena cava*, being separated from one another by the caudate lobe, do not combine to form a single fissure. These are called by the author *fossæ sagittales dextræ.*—TR.

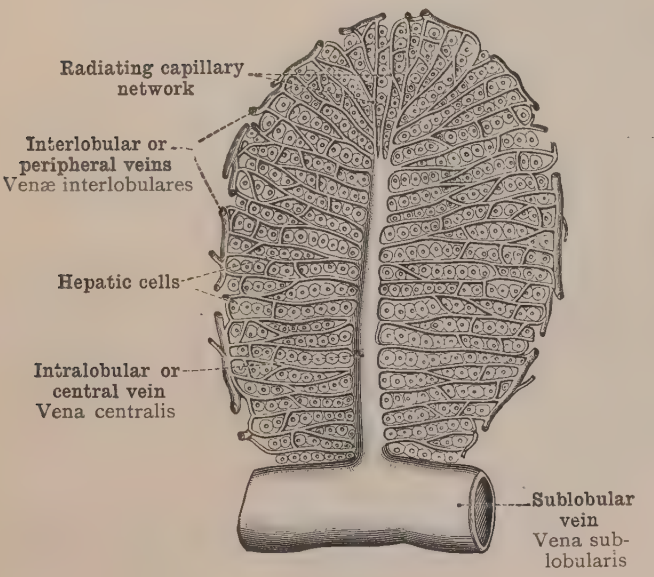


FIG. 741.—DIAGRAMMATIC REPRESENTATION OF A LONGITUDINALLY DIVIDED HEPATIC LOBULE, LOBULUS HEPATICUS. VENA CENTRALIS, INTRALOBULAR OR CENTRAL VEIN; VENÆ INTERLOBULARES, INTERLOBULAR OR PERIPHERAL VEINS; VENA SUBLOBULARIS, SUBLOBULAR VEIN.

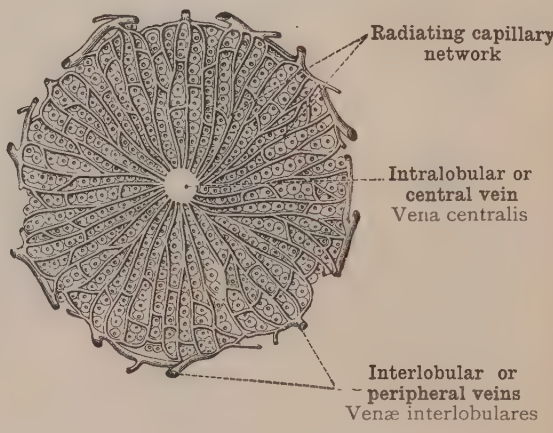


FIG. 742.—DIAGRAMMATIC REPRESENTATION OF A TRANSVERSELY-DIVIDED HEPATIC LOBULE. VENA CENTRALIS, INTRALOBULAR OR CENTRAL VEIN; VENÆ INTERLOBULARES, INTERLOBULAR VEINS.

Mucous glands of the biliary ducts[1]
Glandulæ mucosæ biliosæ
Branches of the hepatic duct
Rami ductus hepatici
Aberrant biliary ducts with mucous glands
Vasa aberrantia hepatis cum glandulis mucosis
Areolar or fibrous coat of the liver, or capsule of Glisson
Capsula fibrosa (Glissoni)
7/1

1 *Mucous Glands of the Biliary Ducts.*—Quain writes ("Anatomy," tenth ed., vol. iii., part iv., p. 135): "In the portal canals . . . the ducts present numerous openings on the inner surface which are scattered irregularly in the larger ducts, but in the subdivisions are arranged in two longitudinal rows, one at each side of the vessel. These openings were formerly supposed to be the orifices of mucous glands; but, while the main ducts are studded with true mucous glands of lobulated form and with minute orifices, the openings now referred to belong to saccular and tubular recesses, which are often branched and anastomosing, and may be beset all over with tubular projections (Theile)."—TR.

FIG. 743.—VASA ABERRANTIA HEPATIS, ABERRANT BILIARY DUCTS, WITH MUCOUS GLANDS (GLANDULÆ MUCOSÆ BILIOSÆ), FROM ONE OF THE PORTAL CANALS, INJECTED WITH PRUSSIAN BLUE.

FIG. 744.—VESICA FELLEA, THE GALL-BLADDER, MODERATELY DISTENDED, WITH THE CYSTIC DUCT (DUCTUS CYSTICUS) AND THE JUNCTION OF THE LATTER WITH THE HEPATIC DUCT (DUCTUS HEPATICUS) TO FORM THE COMMON BILE-DUCT (DUCTUS COMMUNIS CHOLEDOCHUS).

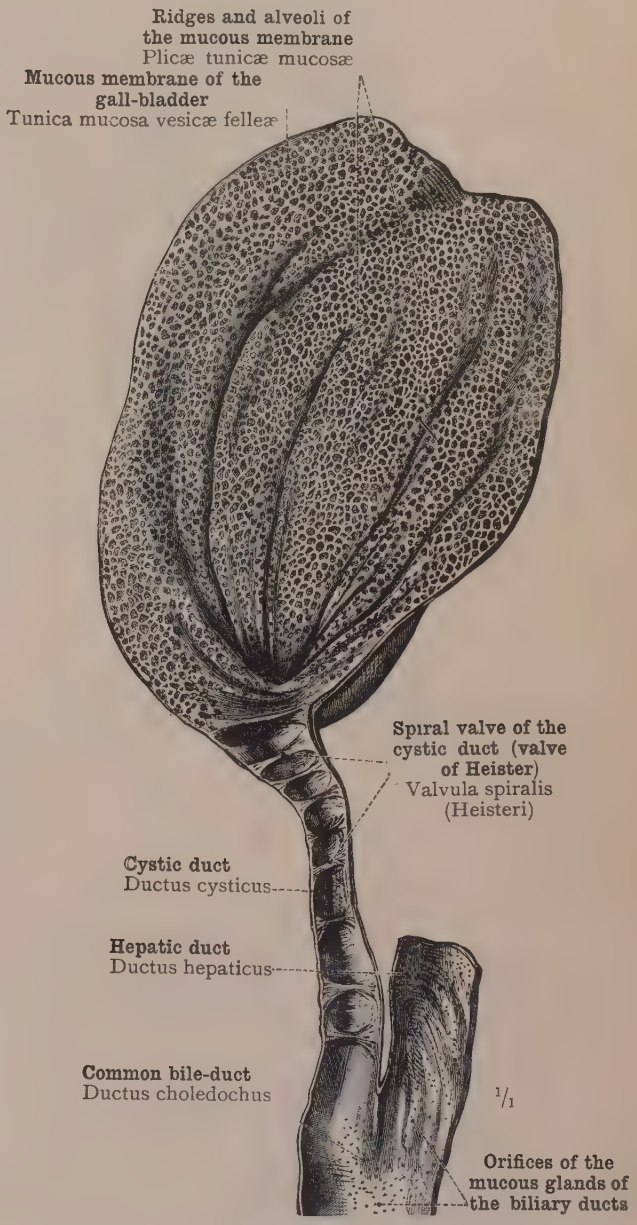


FIG. 745.—THE GALL-BLADDER AND THE CYSTIC DUCT, OPENED LONGITUDINALLY. VALVULA SPIRALIS (HEISTERI), THE SPIRAL VALVE OF THE CYSTIC DUCT, OR HEISTER'S VALVE.

Hepar—The liver.

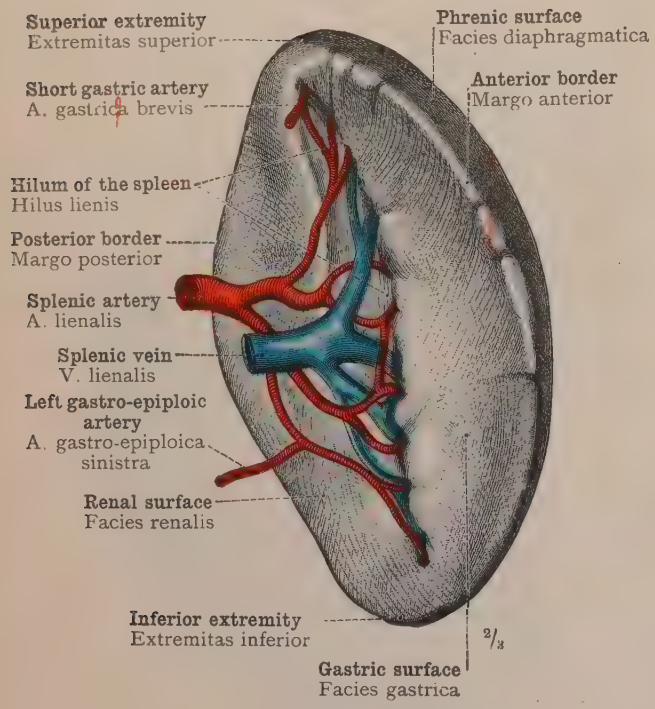


FIG 746.—LIEN, THE SPLEEN, INNER OR GASTRIC ASPECT, WITH THE BRANCHING TERMINATION OF THE SPLENIC ARTERY AND VEIN LAID BARE.[2]

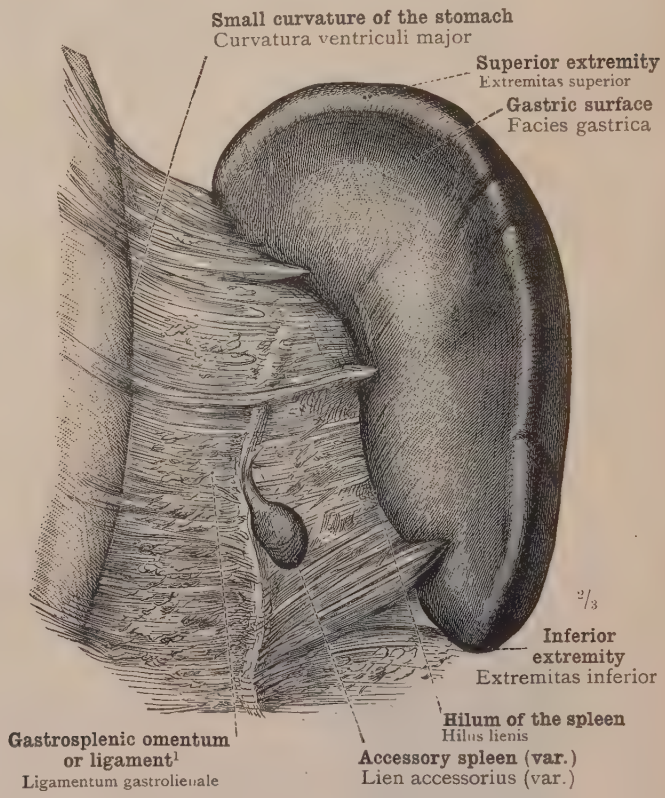


FIG. 747.—THE SPLEEN, WITH THE GASTROSPLENIC OMENTUM LEFT ATTACHED, SEEN FROM BEFORE. LIEN ACCESSORIUS, AN ACCESSORY SPLEEN.

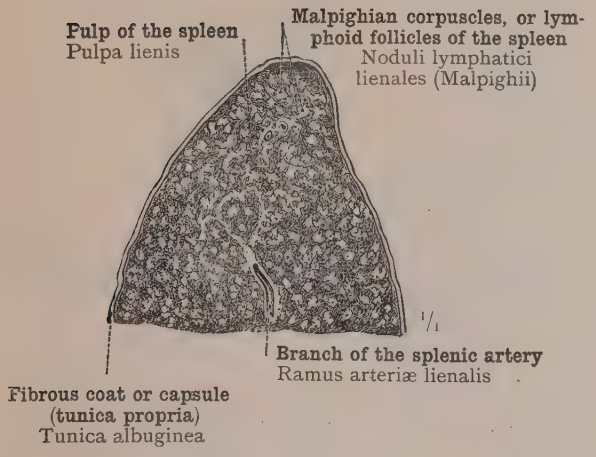


FIG. 748.—A PORTION OF THE CUT SURFACE OF THE SPLEEN OF A YOUNG MALE SUICIDE, IN WHICH THE MALPIGHIAN CORPUSCLES OR LYMPHOID FOLLICLES OF THE SPLEEN (NODULI LYMPHATICI LIENALES MALPIGHII) ARE VERY ABUNDANT.

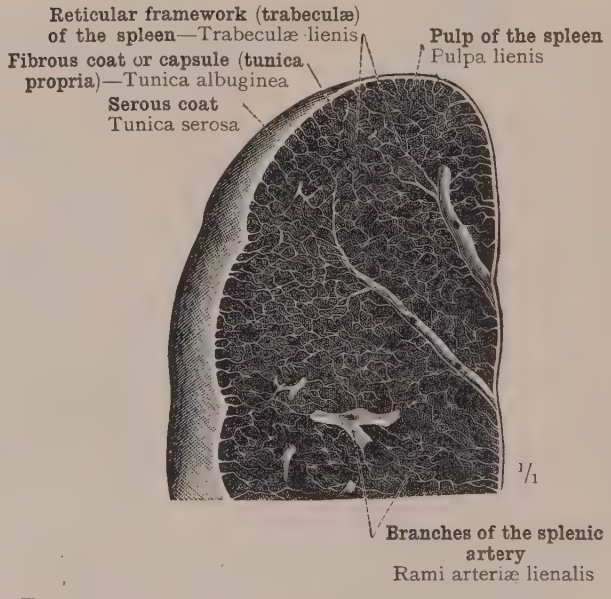
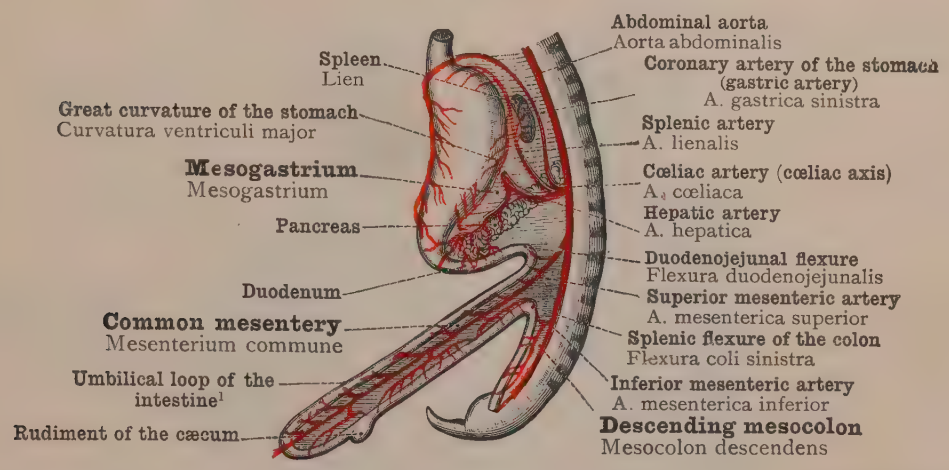


FIG. 749.—A PORTION OF THE CUT SURFACE OF A SPLEEN FROM WHICH THE PULP HAS BEEN PARTIALLY REMOVED BY LONG-CONTINUED AFFUSION WITH WATER, SO THAT THE FIBROUS FRAMEWORK OF THE ORGAN HAS BEEN ISOLATED.

[1] See Appendix, note 10.

[2] See Appendix, note 19.



[1] *Umbilical Loop of the Intestine.*—"The small intestine is . . . at first quite short and straight, with a wide aperture to the yolk-sac, but gradually lengthens as the communication with the yolk-sac becomes more contracted, and . . . develops a long V-shaped loop opposite the attachment of the vitalline duct."—Quain, *op. cit.*, vol. i., part i., p. 104.

FIG. 750.—CONDITION OF THE HUMAN ALIMENTARY CANAL AND MESENTERY IN THE SIXTH WEEK OF INTRA-UTERINE LIFE. DIAGRAMMATIC.

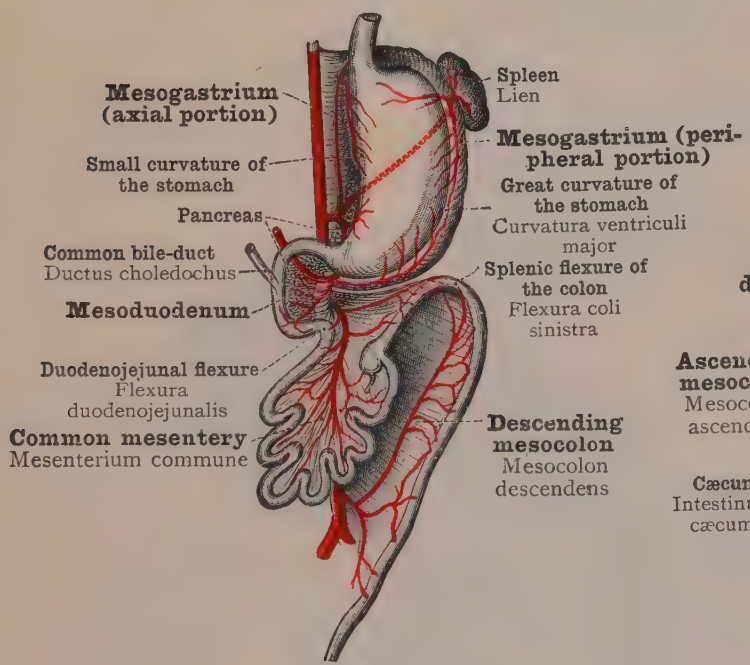


FIG. 751.—CONDITION OF THE HUMAN ALIMENTARY CANAL AND MESENTERY IN THE EIGHTH WEEK OF INTRA-UTERINE LIFE. DIAGRAMMATIC.

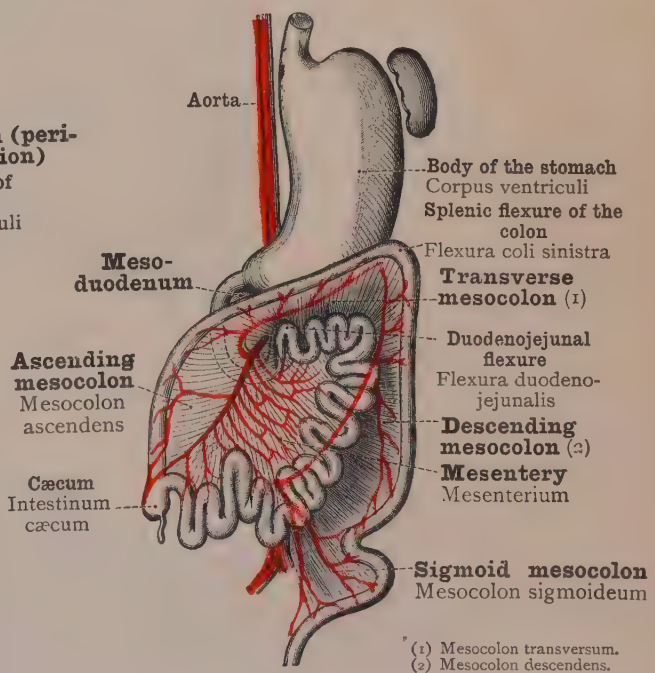


FIG. 752.—CONDITION OF THE HUMAN ALIMENTARY CANAL AND MESENTERY IN THE MIDDLE OF THE FOURTH MONTH OF INTRA-UTERINE LIFE (MONTHS OF FOUR WEEKS EACH). DIAGRAMMATIC.

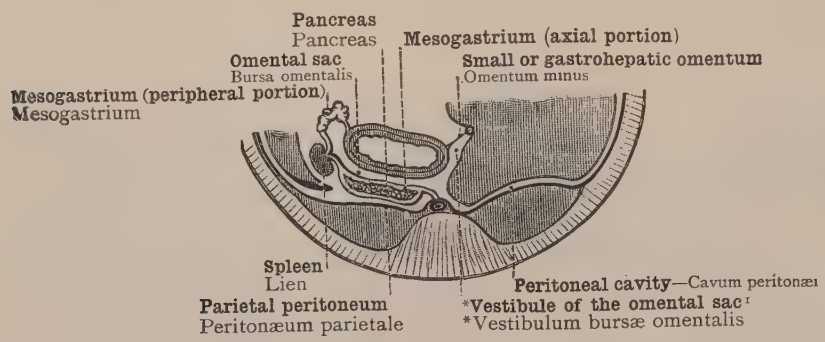


FIG. 753.—MESOGASTRIUM AND OMENTAL SAC (BURSA OMENTALIS, LESSER CAVITY OF THE PERITONEUM) *BEFORE* THE ADHESION OF THE AXIAL PORTION OF THE MESOGASTRIUM TO THE PARIETAL PERITONEUM. BEGINNING OF THE THIRD MONTH OF INTRA-UTERINE LIFE (MONTHS OF FOUR WEEKS EACH). TRANSVERSE SECTION. DIAGRAMMATIC.

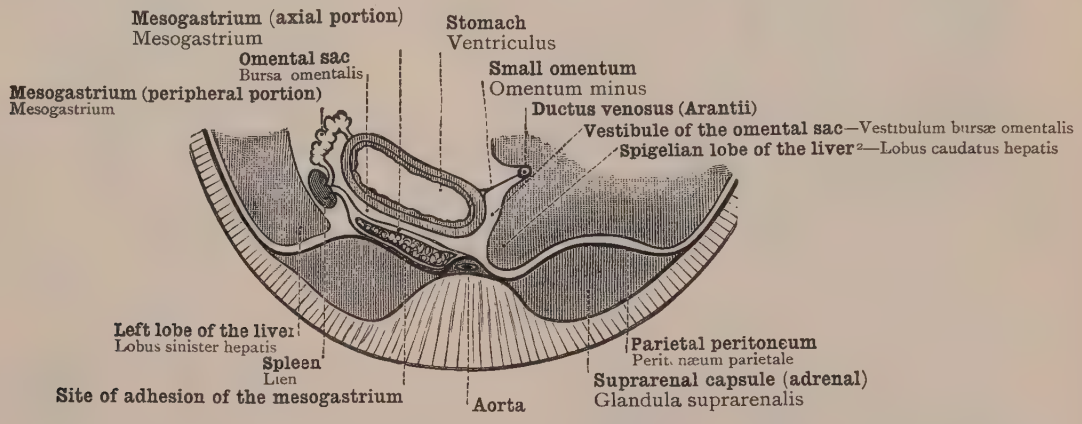


FIG. 754.—MESOGASTRIUM AND OMENTAL SAC (BURSA OMENTALIS, LESSER CAVITY OF THE PERITONEUM) *AFTER* THE ADHESION OF THE AXIAL PORTION OF THE MESOGASTRIUM TO THE PARIETAL PERITONEUM. END OF THE FOURTH MONTH OF INTRA-UTERINE LIFE (MONTHS OF FOUR WEEKS EACH). TRANSVERSE SECTION. DIAGRAMMATIC.

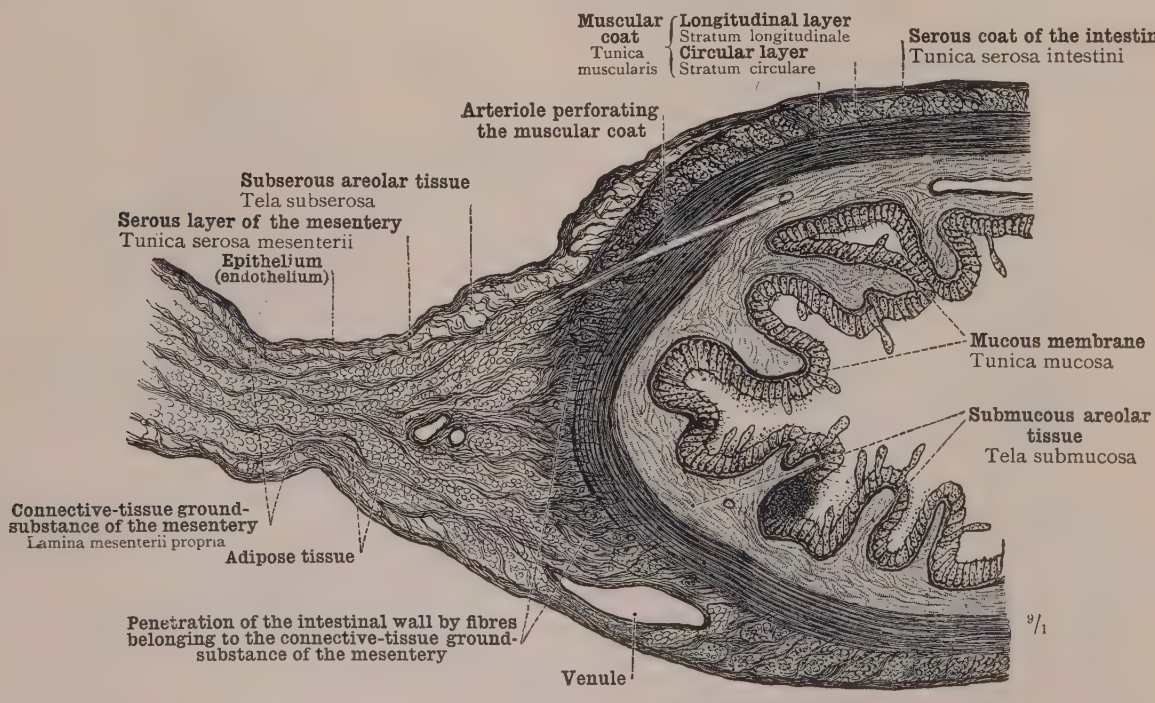
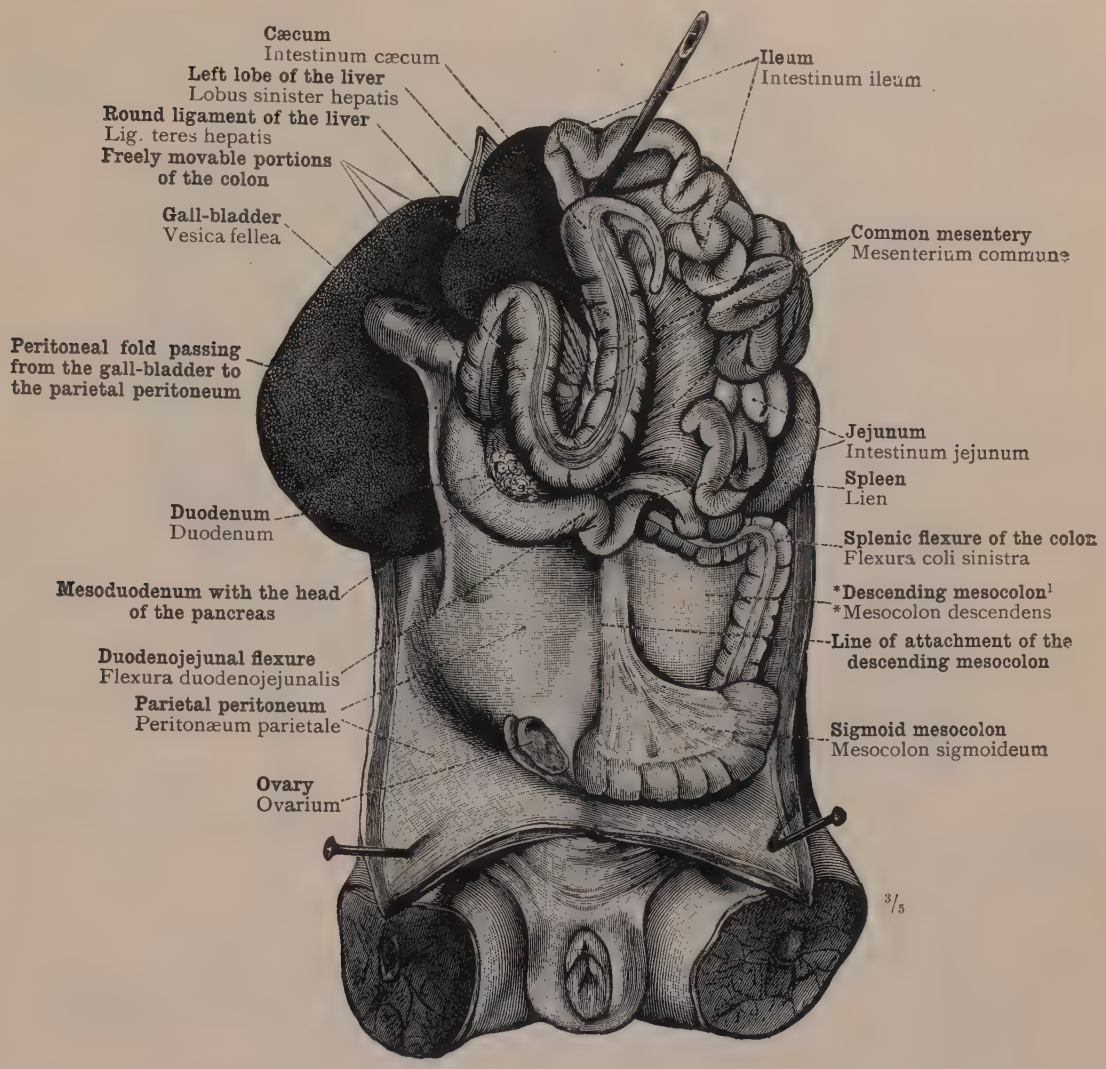


FIG. 755.—THE MESENTERY OF THE SMALL INTESTINE AND ITS ATTACHMENT TO THE INTESTINE. TRANSVERSE SECTION.

[1] See note [2] to p. 479.

[2] See Appendix, note [16].



1 **Descending Mesocolon.*—I follow the author in the use of this term for the peritoneum internal to the descending colon. In England, however, the use of the term *mesentery* is usually restricted to the peritoneal folds suspending *freely movable* portions of the alimentary canal, and is no longer applied in cases in which, as here in the case of the descending mesocolon, the originally free mesentery has become adherent to the parietal peritoneum. The existence of a distinct *descending mesocolon* (in the English sense of the term) is rare.—TR.

FIG. 756.—MESENTERIUM COMMUNE, COMMON MESENTERY, OF AN INFANT AGED THREE WEEKS (VARIETY).

The adhesion of the duodenum to the parietal peritoneum of the posterior wall of the abdominal cavity has taken place after the normal manner; but the adhesion of the colon and of the ascending mesocolon to the anterior surface of the duodenum and to the posterior wall of the abdominal cavity has failed to take place, so that the ascending colon is freely movable, and has been turned upwards with the cæcum and the coils of the jejunum and ileum; the delimitation of the ascending colon from the transverse colon is lacking. The ascending mesocolon combines with the transverse mesocolon and the mesentery of the small intestine to form a freely movable common mesentery, which corresponds to the mesentery of the primitive umbilical loop of the intestine (*see Fig.* 750 *on page* 451, *and note* 1 *to that page*). In the right half of the lower part of the abdominal cavity the primary parietal peritoneum remains exposed; whereas in the left half the parietal peritoneum is, as is normally the case, represented by the anterior layer of the adherent descending mesocolon (*see note* 1 *above*).

Peritonæum—Peritoneum.—Mesenterium—Mesentery.

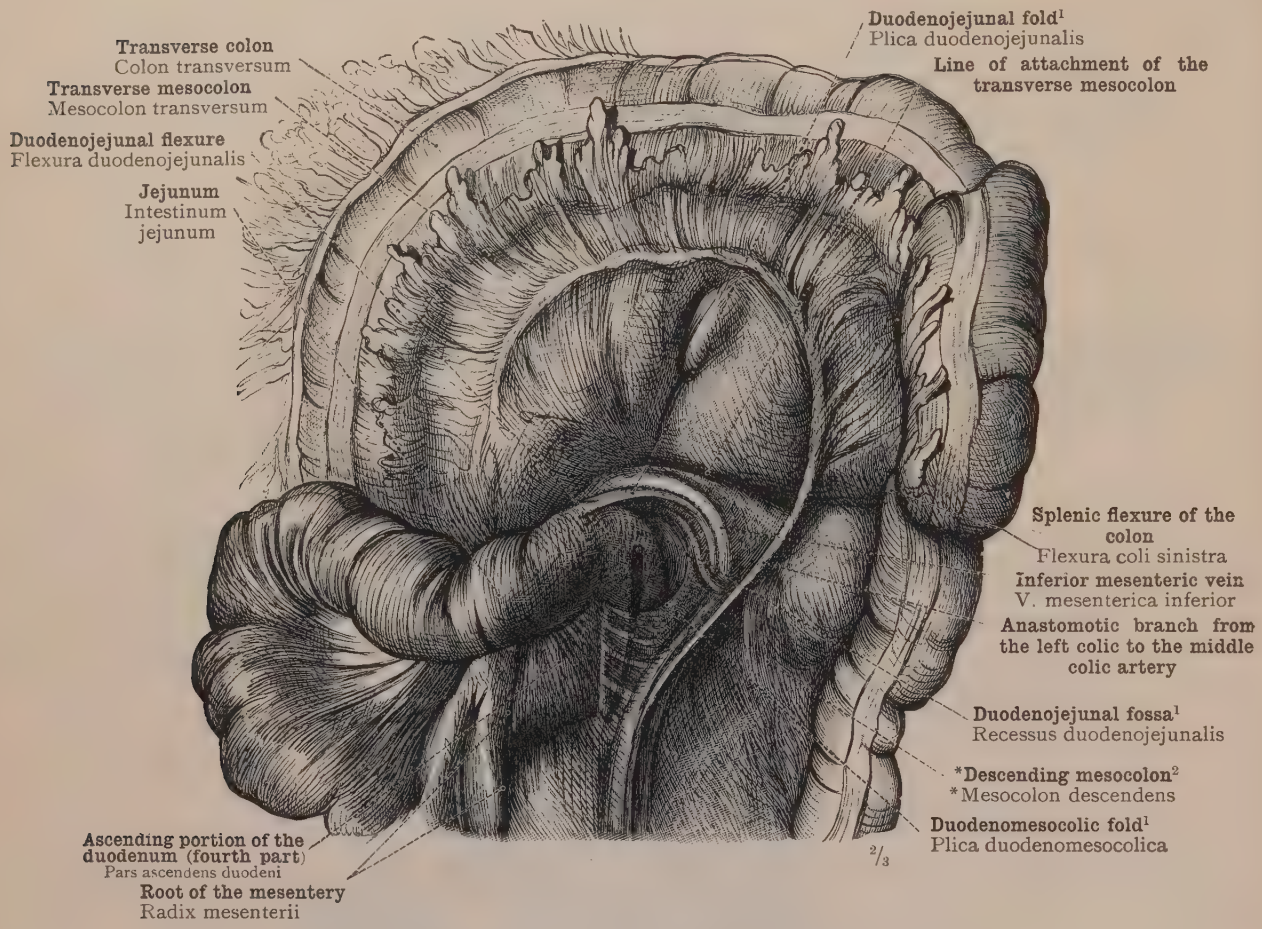


FIG. 757.—RECESSUS DUODENOJEJUNALIS, DUODENOJEJUNAL FOSSA.[3]

The transverse colon has been turned upwards; the jejunum and ileum have been pushed as far to the right as possible, to expose the duodenojejunal flexure, the lower (posterior) surface of the transverse mesocolon, and the *descending mesocolon. A sound has been passed into the lower part of the duodenojejunal fossa (*i.e.*, the inferior duodenal fossa—*see Appendix, note* [20]), which extends beside the ascending portion of the duodenum for its whole length, and is bounded in front by the duodenomesocolic fold (inferior duodenal fold)

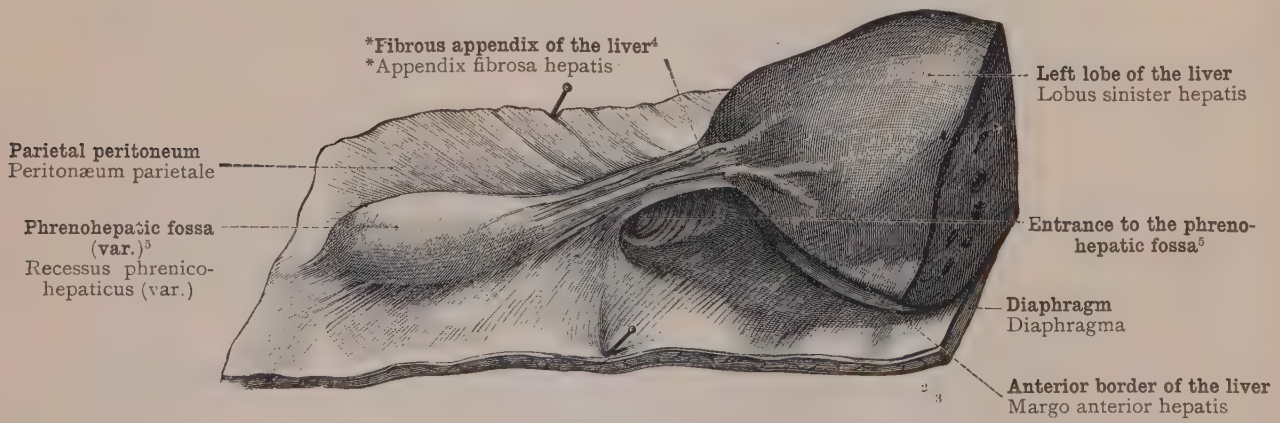


FIG. 758.—RECESSUS PHRENICOHEPATICUS, PHRENOHEPATIC FOSSA.[5] A PORTION OF THE LEFT LOBE OF THE LIVER, WITH THE FIBROUS APPENDIX OF THE LIVER, AND A PORTION OF THE DIAPHRAGM.

[1] See Appendix, note [20]. [2] See note [1] to p. 453. [3] See Appendix, note [21].
[4] See Appendix, note [14]. [5] See Appendix, note [22].

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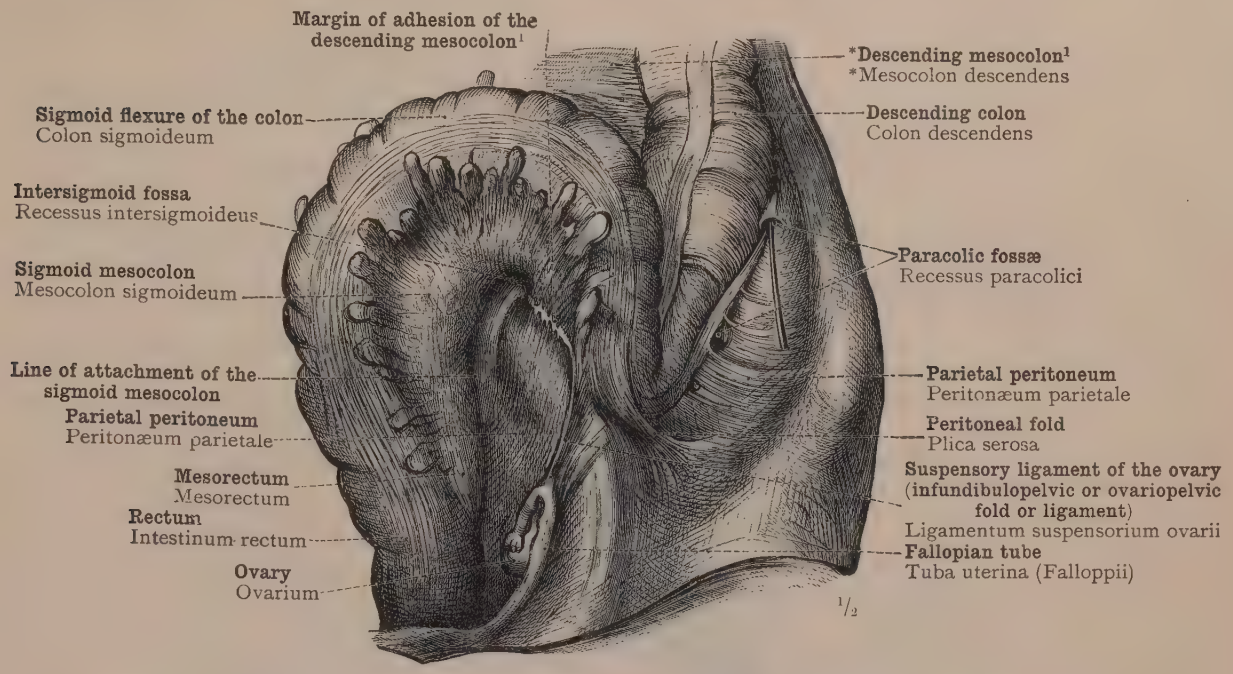


FIG. 759.—RECESSUS INTERSIGMOIDEUS, INTERSIGMOID FOSSA; RECESSUS PARACOLICI, PARACOLIC FOSSÆ. LEFT ILIAC FOSSA WITH THE LEFT LATERAL WALL OF THE PELVIS. THE SIGMOID MESOCOLON PASSING INTO THE MESORECTUM. SEEN FROM BEFORE.

The sigmoid flexure has been drawn upwards.

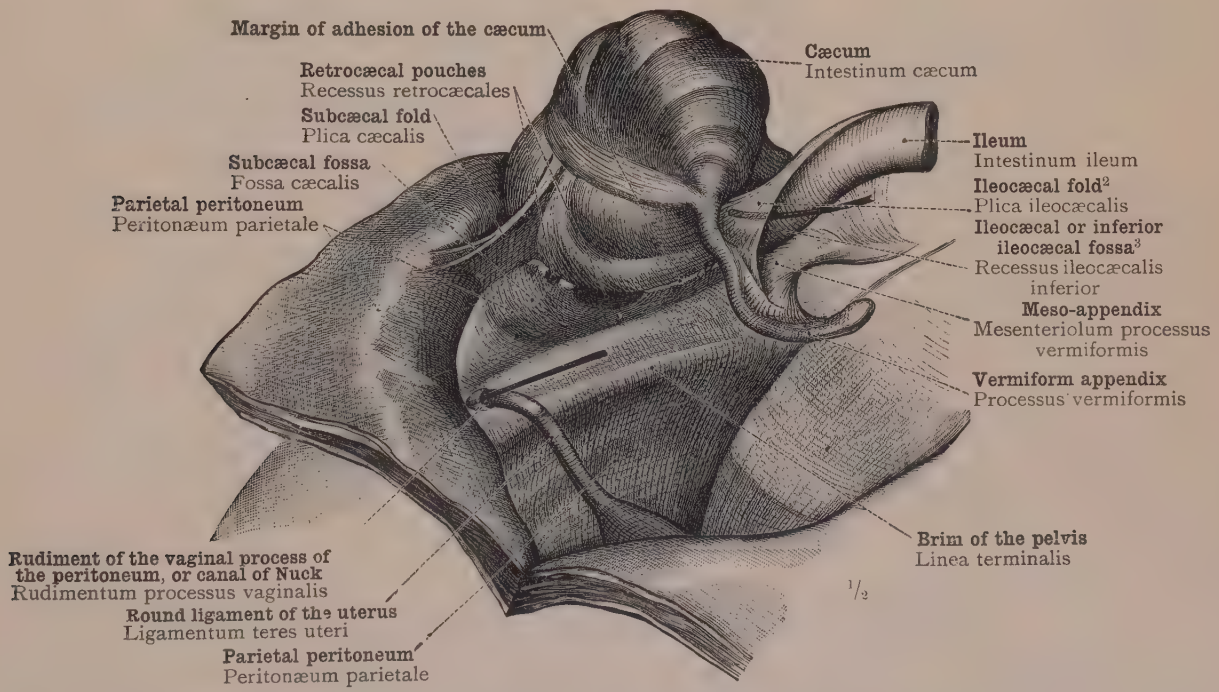


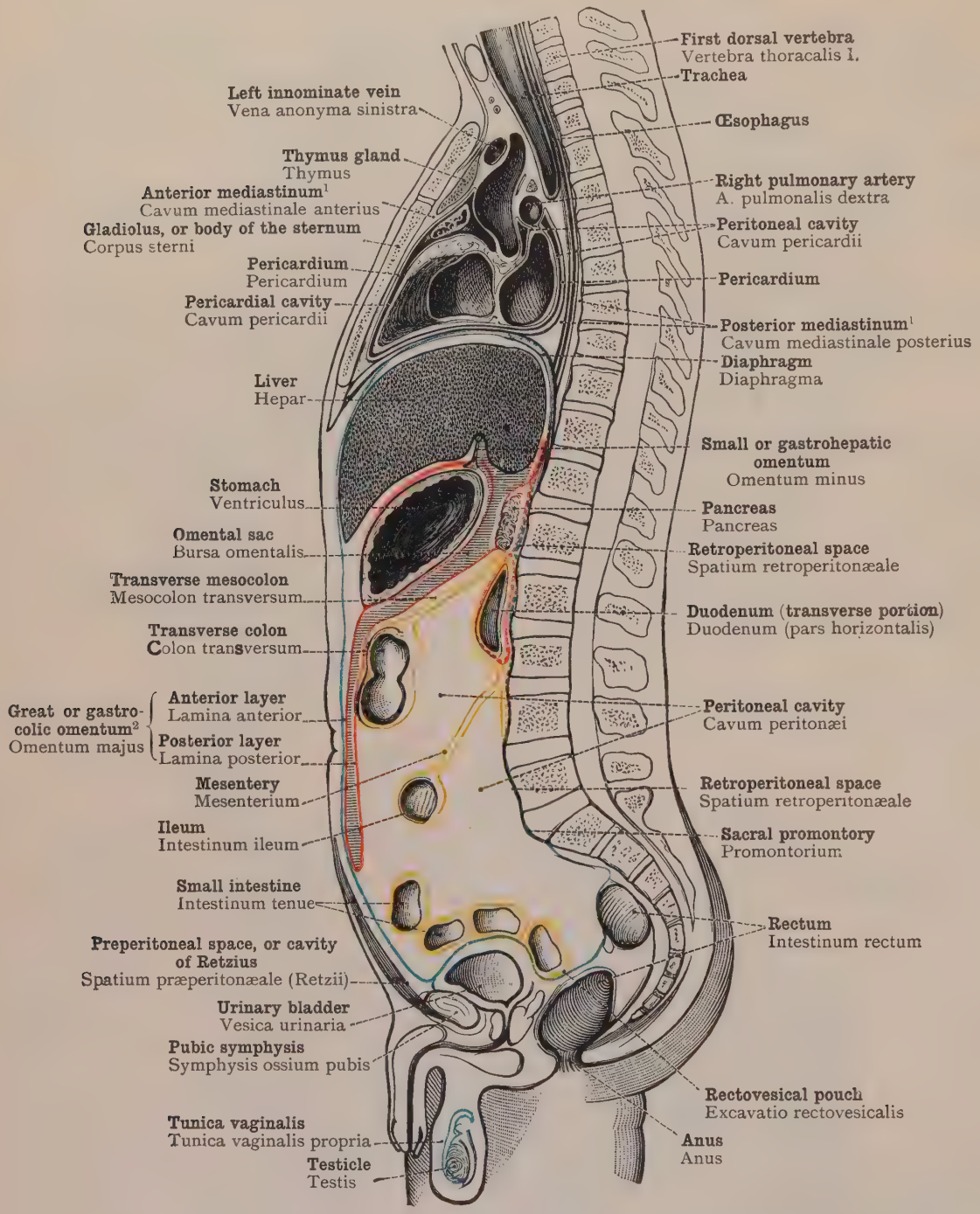
FIG. 760.—FOSSA CÆCALIS, SUBCÆCAL FOSSA; RECESSUS RETROCÆCALES. RETROCÆCAL POUCHES; RECESSUS ILEOCÆCALIS INFERIOR, INFERIOR ILEOCÆCAL FOSSA. RIGHT ILIAC FOSSA WITH THE RIGHT LATERAL WALL OF THE PELVIS. SEEN OBLIQUELY FROM BEFORE AND THE LEFT SIDE.

The cæcum has been drawn upwards.

[1] See note [1] to p. 453.

[2] Called by Treves the *bloodless fold*.—TR.

[3] See Appendix, note [23].



[1] See Appendix, note 24.
[2] *Epiploon*, the Greek word for omentum, is occasionally used to denote the great omentum.—Tr.
[3] The visceral layer of peritoneum covering the liver is not indicated in the diagram by a coloured line.—Tr.

FIG. 761.—DIAGRAMMATIC REPRESENTATION OF THE NORMAL COURSE AND ARRANGEMENT OF THE PERITONEUM, THE MESENTERY, AND THE OMENTAL SAC.

The blue lines indicate the primary parietal peritoneum ; the red lines, the mesogastrium ; and the yellow lines, the visceral peritoneum, including the peritoneal layers of the mesentery. The continuous lines indicate the free surfaces of the peritoneum ; the dotted lines, those parts of the peritoneum in which, owing to secondary adhesion, the free surfaces have disappeared (*see note* [3] *above*).

Peritonæum—Peritoneum.—Mesenterium—Mesentery.

APPARATUS RESPIRATORIUS

RESPIRATORY ORGANS

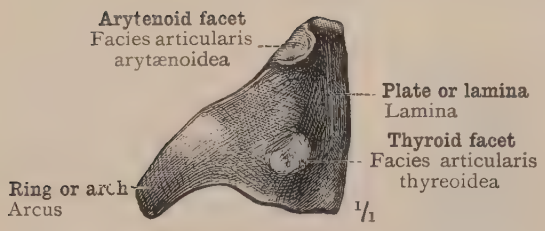


FIG. 762.—SEEN FROM THE LEFT SIDE.

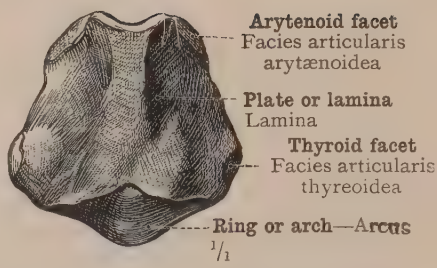


FIG. 763.—SEEN FROM BEHIND.

CARTILAGO CRICOIDEA, THE CRICOID CARTILAGE.

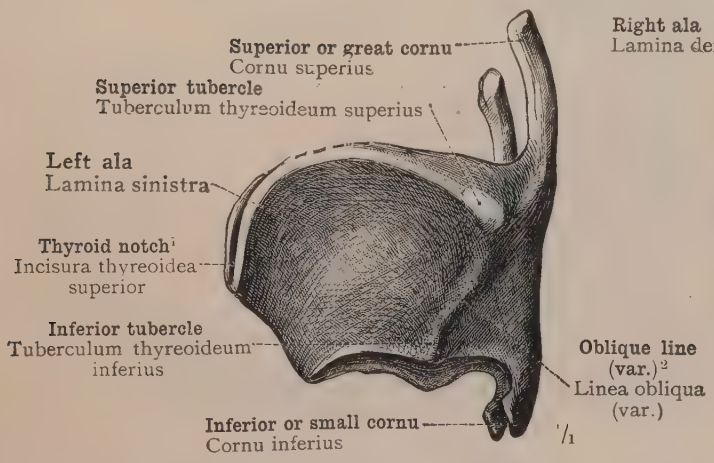


FIG. 764.—SEEN FROM THE LEFT SIDE.

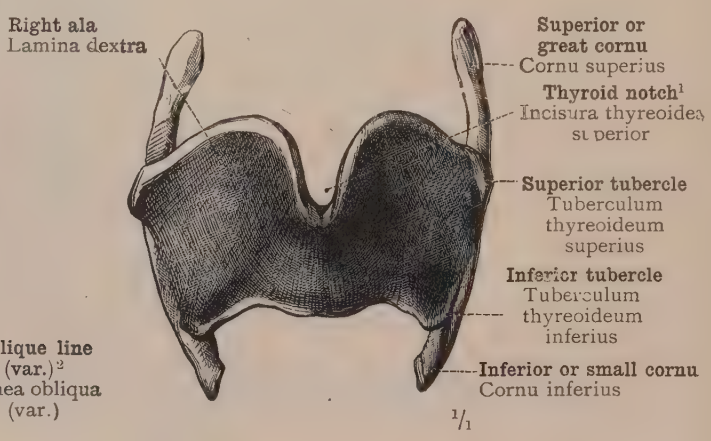


FIG. 765.—SEEN FROM BEFORE.

CARTILAGO THYREOIDEA, THE THYROID CARTILAGE.

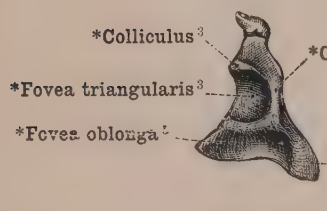


FIG. 766.—SEEN FROM THE OUTER SIDE.

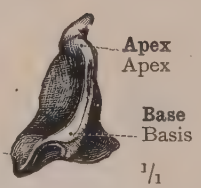


FIG. 767.—SEEN FROM BEHIND.

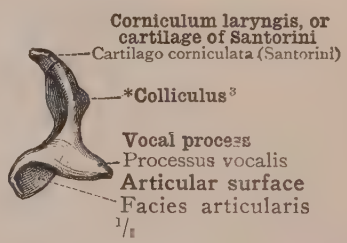


FIG. 768.—SEEN FROM THE INNER SIDE.

CARTILAGO ARYTÆNOIDEA SINISTRA, THE LEFT ARYTENOID CARTILAGE,[3] WITH THE CORNICULUM LARYNGIS, OR CARTILAGE OF SANTORINI.

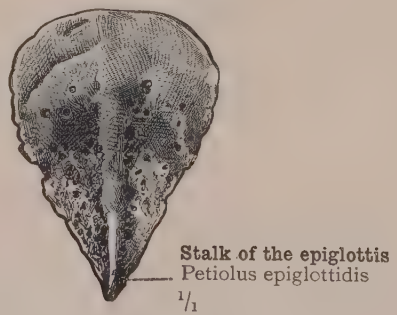


FIG. 769.—CARTILAGO EPIGLOTTICA, CARTILAGE OF THE EPIGLOTTIS. SEEN FROM BEHIND.

[1] Or *great median notch* of the thyroid cartilage.
[2] See Appendix, note 25.
[3] See Appendix, note 26.

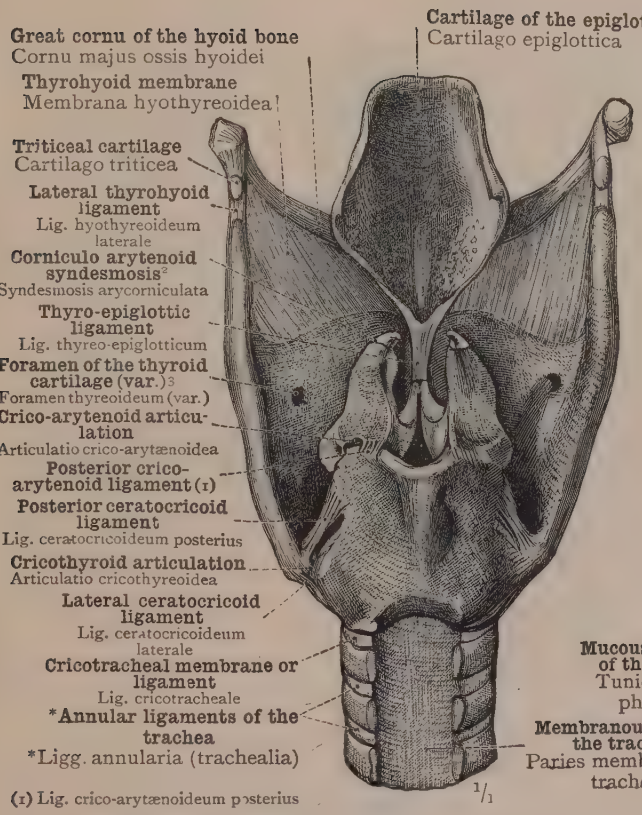


FIG. 770.—LIGAMENTS OF THE LARYNX, AND THE THYROHYOID MEMBRANE, SEEN FROM BEHIND.

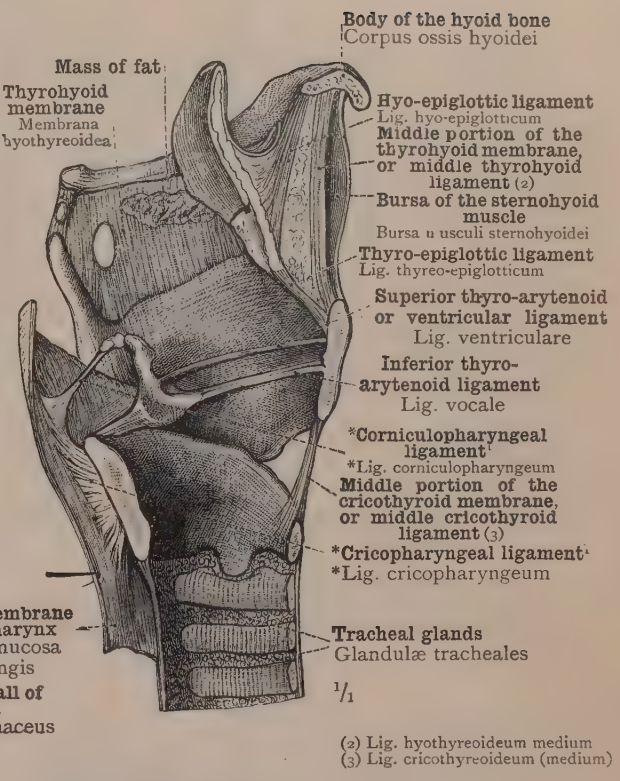


FIG. 771.—LIGAMENTS OF THE LARYNX, AND THE THYROHYOID MEMBRANE, SHOWN IN THE LEFT HALF OF A SAGITTALLY-HEMISECTED LARYNX. SEEN FROM WITHIN.

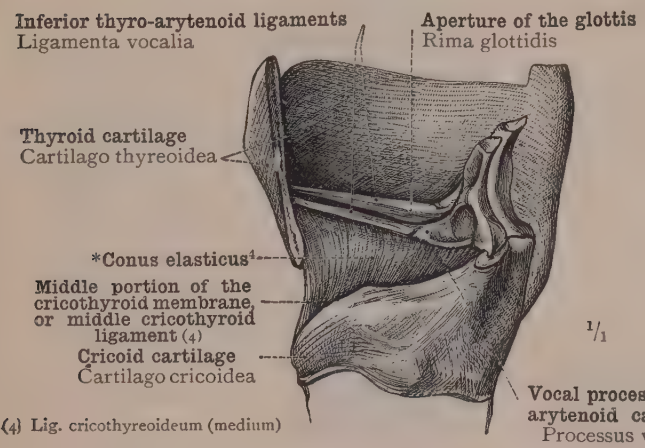


FIG. 772.—*CONUS ELASTICUS,[4] WITH THE INFERIOR THYRO-ARYTENOID LIGAMENTS, WHICH LATTER FORM THE ELASTIC ELEMENTS OF THE TRUE VOCAL CORDS (PLICÆ VOCALES). SEEN FROM THE LEFT SIDE.

The parts have been laid bare by the removal of the greater part of the left ala of the thyroid cartilage.

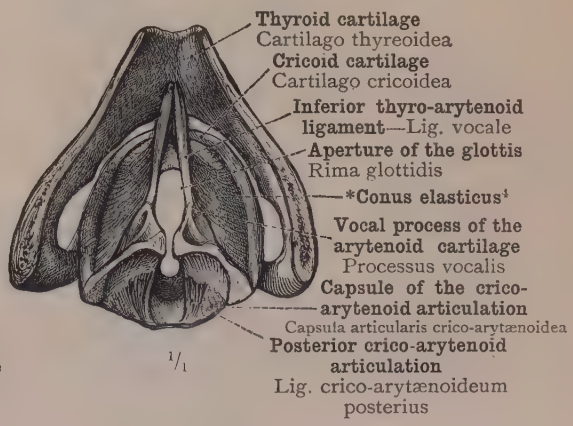


FIG. 773.—*CONUS ELASTICUS,[4] WITH THE INFERIOR THYRO-ARYTENOID LIGAMENTS, DISPLAYED FROM ABOVE BY THE REMOVAL OF THE UPPER PORTIONS OF THE ALÆ OF THE THYROID CARTILAGE AND THE SOFT PARTS INTERNAL TO THE ALÆ.

[1] See Appendix, note [27]. [2] See Appendix, note [28]. [3] See Appendix, note [29]. [4] See Appendix, note [30].

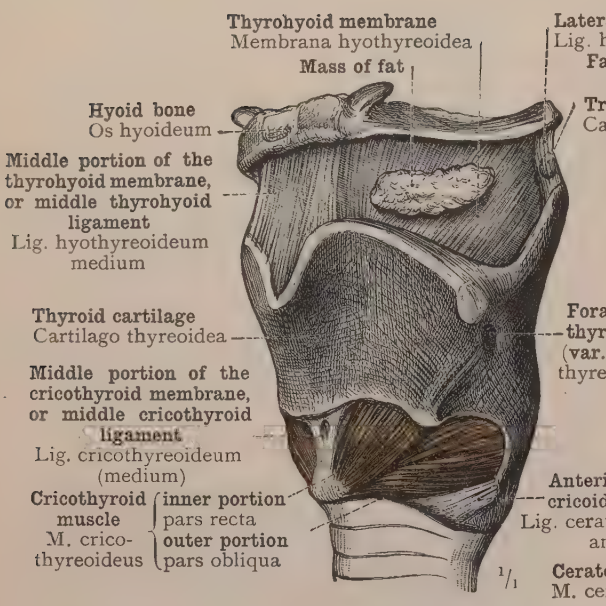


FIG. 774.—THE LARYNX WITH THE THYROHYOID MEMBRANE AND THE CRICOTHYROID MUSCLE, SEEN OBLIQUELY FROM THE LEFT SIDE AND BEFORE.

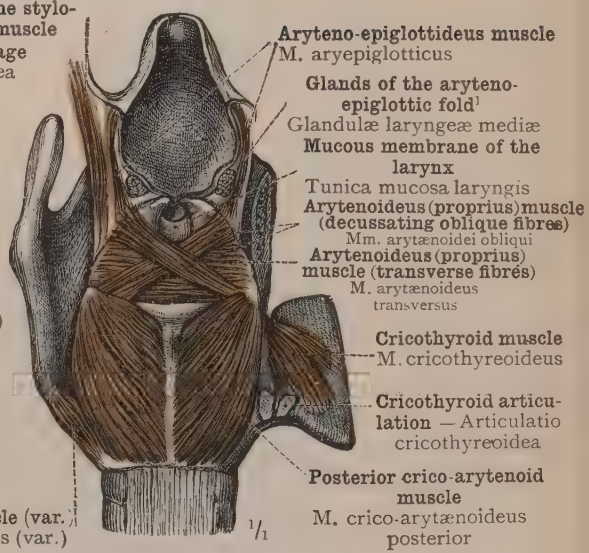


FIG. 775.—THE MUSCLES OF THE LARYNX SEEN FROM BEHIND.

The right ala of the thyroid cartilage has been in part removed.

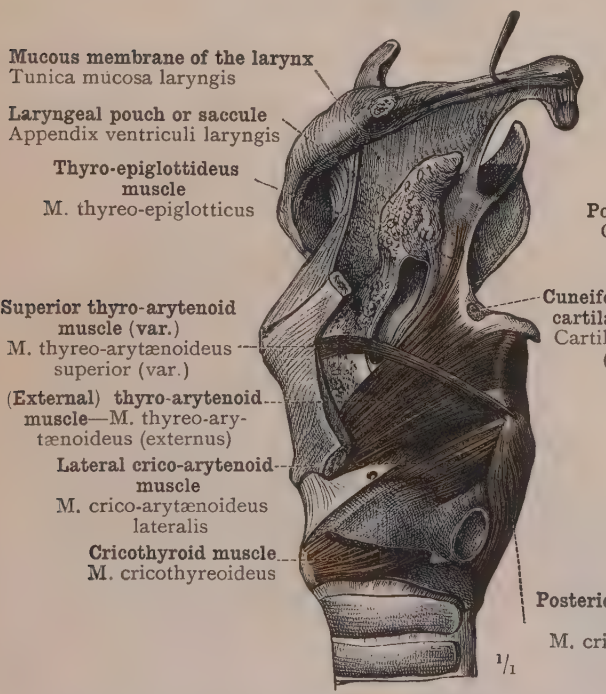


FIG. 776.—THE MUSCLES OF THE LARYNX AS SEEN FROM THE LEFT SIDE AFTER THE REMOVAL OF THE GREATER PART OF THE LEFT ALA OF THE THYROID CARTILAGE.

The laryngeal pouch or saccule (the recess leading upward from the anterior part of the ventricle) is unusually large.

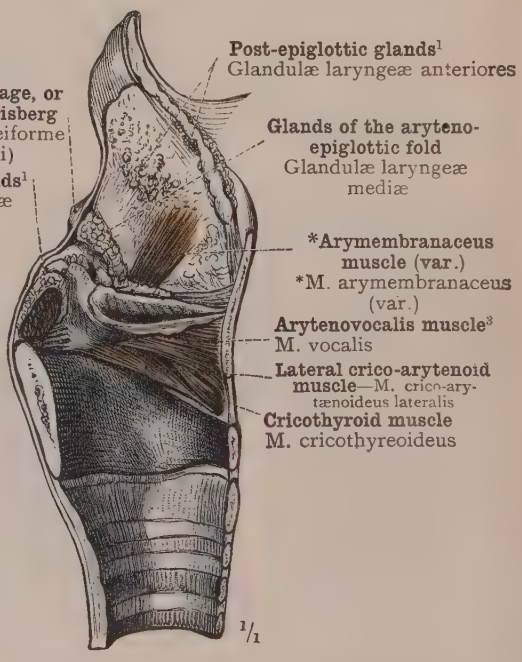


FIG. 777.—THE MUSCLES AND MUCOUS GLANDS OF THE LARYNX, AS SEEN FROM WITHIN IN THE LEFT HALF OF A SAGITTALLY-HEMISECTED LARYNX.

Part of the mucous membrane covering the true and false vocal cords has been left *in situ*.

[1] See Appendix, note 31. [2] See Appendix, note 29.

[3] *Arytenovocalis Muscle.*—This is called by Ludwig *portio aryvocalis musculi thyreo-arytenoidei.*—TR.

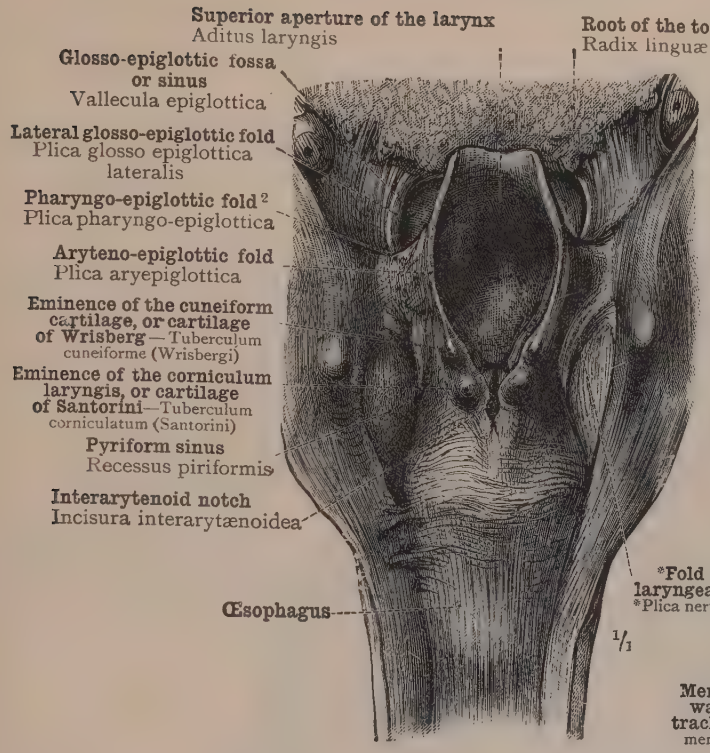


FIG. 778.—ANTERIOR WALL OF THE LARYNGEAL PART OF THE PHARYNX WITH THE SUPERIOR APERTURE OF THE LARYNX.

The posterior wall of the pharynx has been divided along the median line, and the lateral walls have been turned outwards.

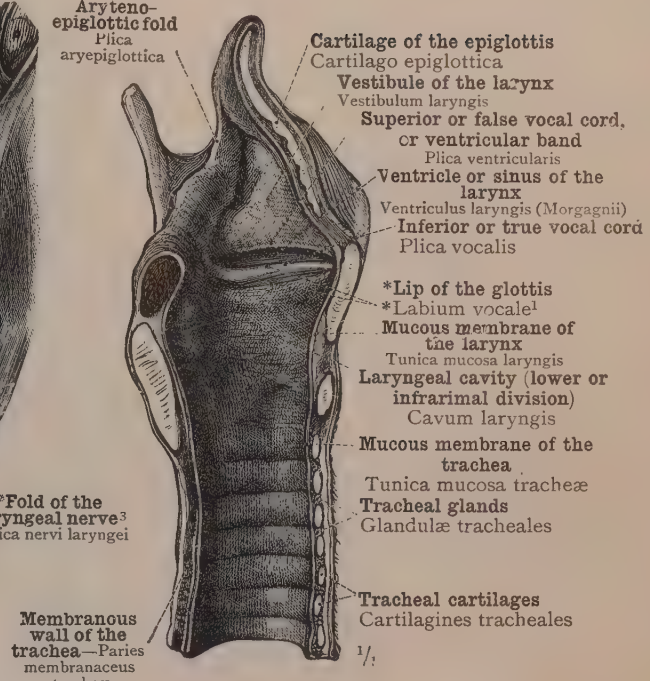
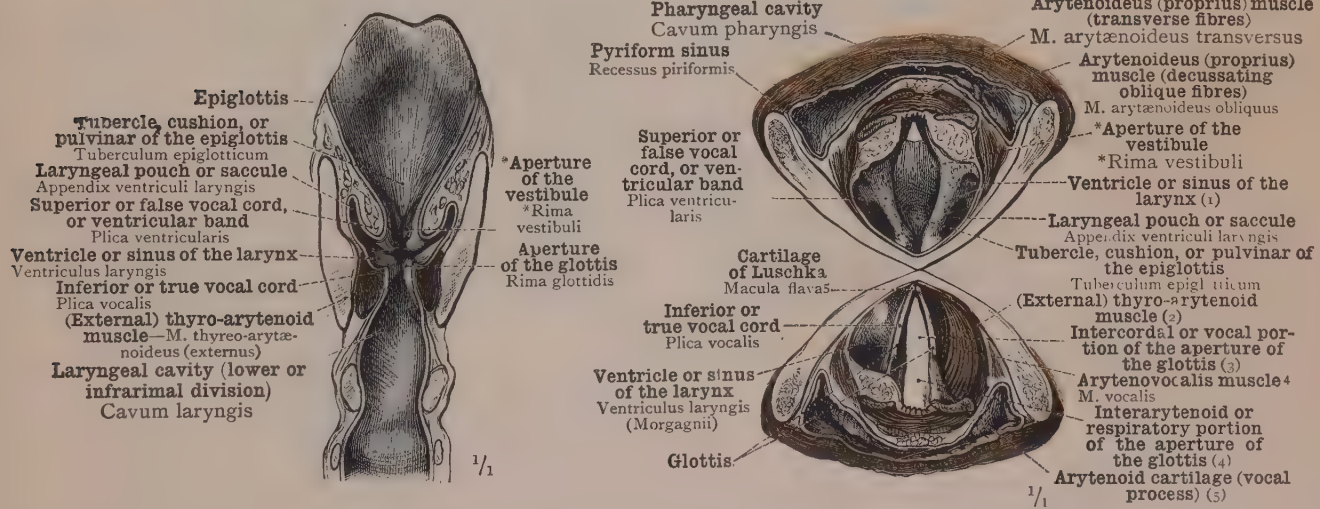


FIG. 779.—LEFT HALF OF A SAGITTALLY-BISECTED LARYNX. PLICA VOCALIS, INFERIOR OR TRUE VOCAL CORD; PLICA VENTRICULARIS, SUPERIOR OR FALSE VOCAL CORD, OR VENTRICULAR BAND; VENTRICULUS LARYNGIS, VENTRICLE OR SINUS OF THE LARYNX.



(1) Ventriculus laryngis (Morgagnii) (2) M. thyreo-arytænoideus (externus) (3) Pars intermembranacea rimæ glottidis
(4) Pars intercartilaginea rimæ glottidis (5) Cartilago arytænoidea (processus vocalis)

FIG. 780.—ANTERIOR HALF OF A CORONALLY-DIVIDED LARYNX. THE VOCAL APPARATUS, OR GLOTTIS; THE APERTURE OF THE GLOTTIS, RIMA GLOTTIDIS; THE INFERIOR OR TRUE VOCAL CORD, PLICA VOCALIS, WITH THE LABIUM VOCALE; THE SUPERIOR OR FALSE VOCAL CORD, OR VENTRICULAR BAND, PLICA VENTRICULARIS; THE VENTRICLE OR SINUS OF THE LARYNX, VENTRICULUS LARYNGIS, AND THE LARYNGEAL POUCH OR SACCULE, APPENDIX VENTRICULI LARYNGIS.

FIG. 781.—UPPER AND LOWER HALVES OF A LARYNX, DIVIDED INTO TWO PARTS BY A HORIZONTAL SECTION PASSING THROUGH THE VENTRICLES OF THE LARYNX, WITH THE ADJACENT PART OF THE PHARYNX.

In the lower half on the right side the mucous membrane of the ventricle of the larynx has been removed, to show the arytenovocalis [4] and (external) thyro-arytenoid muscles.

[1] See Appendix, note 32. [2] See note 7 to p. 415. [3] See note 3 to p. 434. [4] See note 3 to p. 460. [5] See Appendix, note 33.

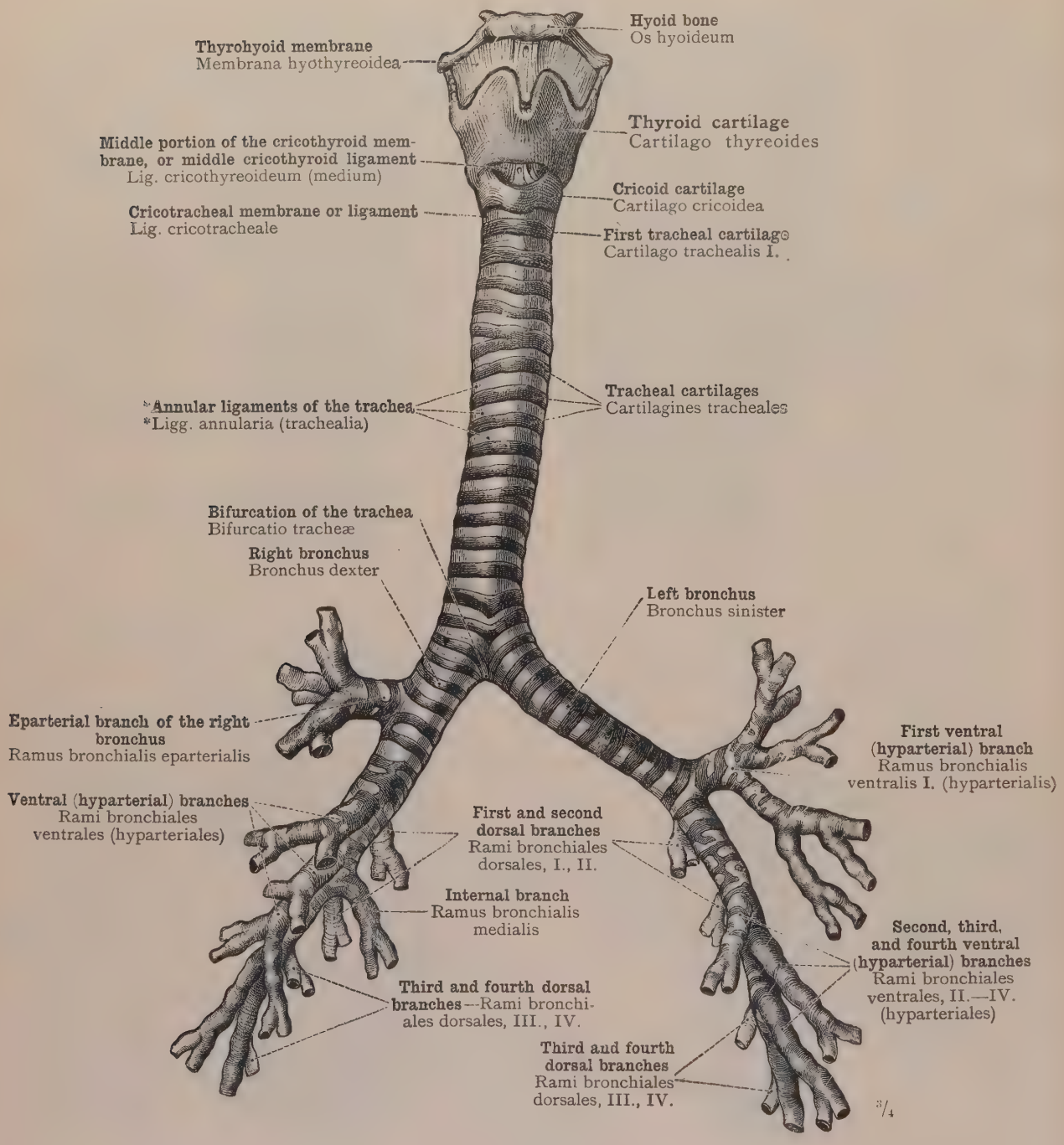


FIG. 782.—THE TRACHEA, ITS BIFURCATION INTO THE RIGHT AND LEFT BRONCHIAL TRUNKS (BRONCHI), AND THE LARGER SUBDIVISIONS OF THESE (RAMI BRONCHIALES). SEEN FROM BEFORE.

The air-passages were filled with tallow before opening the thorax. Subsequently the parts were dissected out and dried.

The Trachea and the Bronchial Ramification.

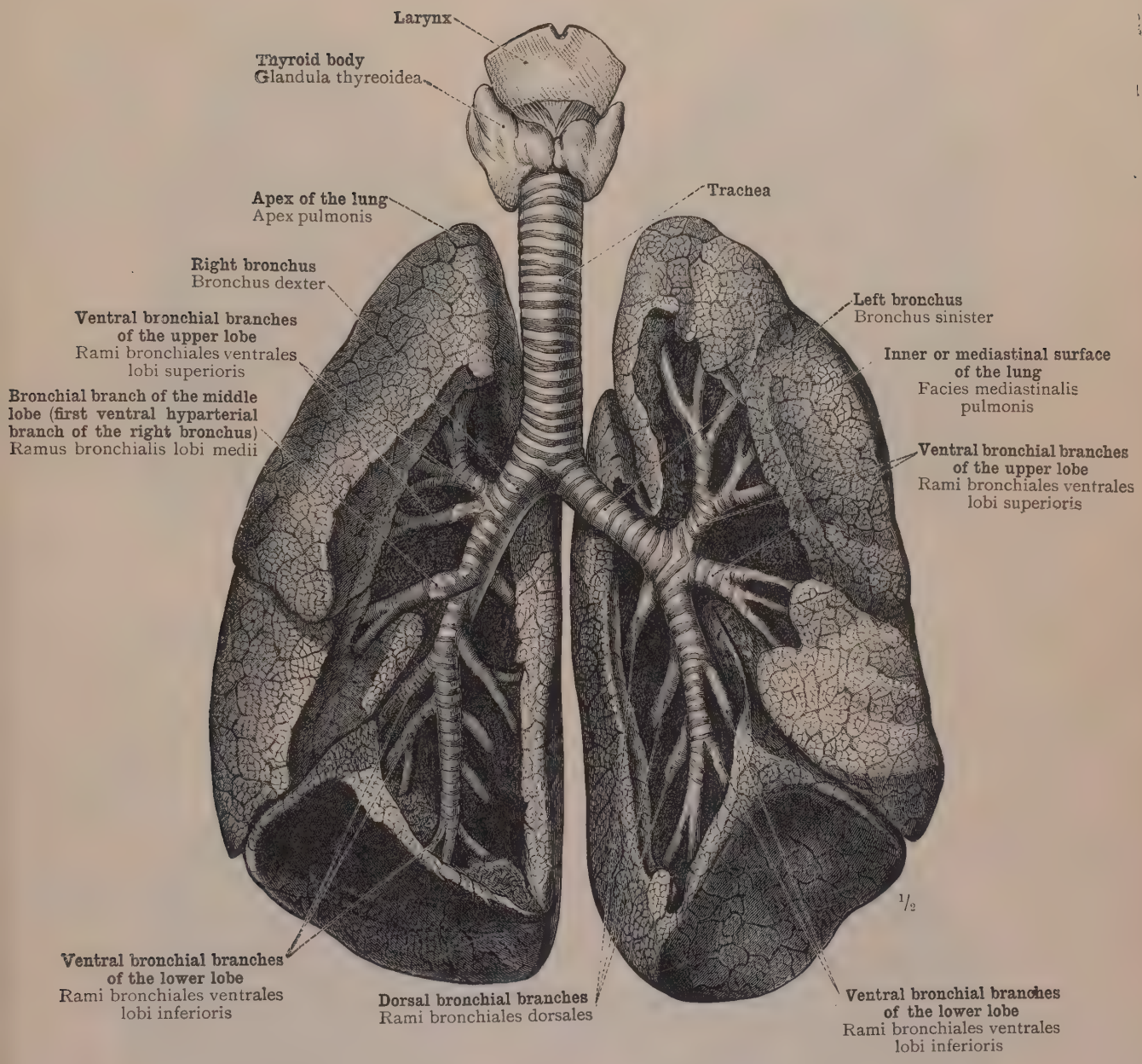

Larynx
Thyroid body
Glandula thyreoidea
Apex of the lung
Apex pulmonis
Trachea
Right bronchus
Bronchus dexter
Left bronchus
Bronchus sinister
Ventral bronchial branches of the upper lobe
Rami bronchiales ventrales lobi superioris
Inner or mediastinal surface of the lung
Facies mediastinalis pulmonis
Bronchial branch of the middle lobe (first ventral hyparterial branch of the right bronchus)
Ramus bronchialis lobi medii
Ventral bronchial branches of the upper lobe
Rami bronchiales ventrales lobi superioris
1/2
Ventral bronchial branches of the lower lobe
Rami bronchiales ventrales lobi inferioris
Dorsal bronchial branches
Rami bronchiales dorsales
Ventral bronchial branches of the lower lobe
Rami bronchiales ventrales lobi inferioris

FIG. 783.—THE TRACHEA, ITS BIFURCATION INTO THE RIGHT AND LEFT BRONCHIAL TRUNKS (BRONCHI), AND THE LARGER SUBDIVISIONS OF THESE (RAMI BRONCHIALES). RELATIONS OF THE BRONCHIAL BRANCHES TO THE LOBES OF THE LUNG AND TO THE DIFFERENT REGIONS OF THESE LOBES. SEEN FROM BEFORE.

After the lungs had been steeped in alcohol, the bronchial tubes were exposed from the inner or mediastinal surface of the lungs by the removal of the portions of lung tissue by which they were covered. The lungs were drawn a little apart from one another anteriorly.

The Trachea and the Bronchial Ramification.

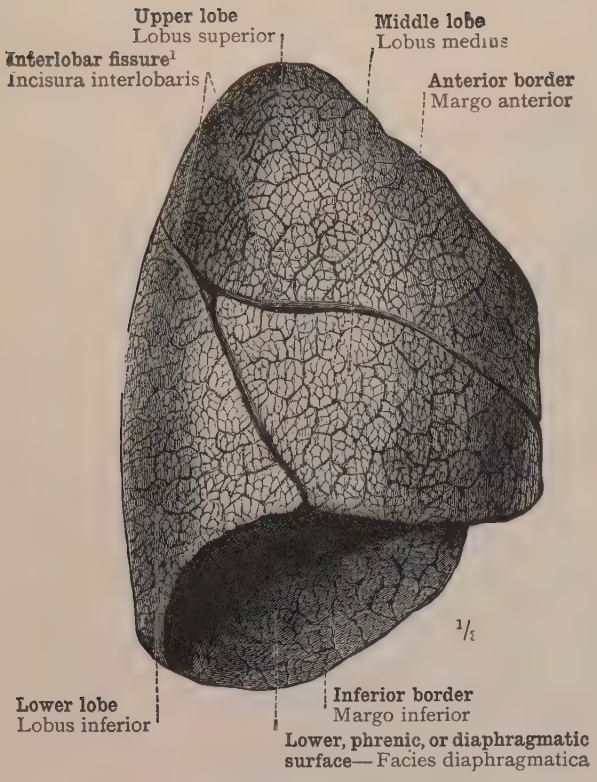


FIG. 784.—RIGHT LUNG. OUTER OR COSTAL SURFACE.

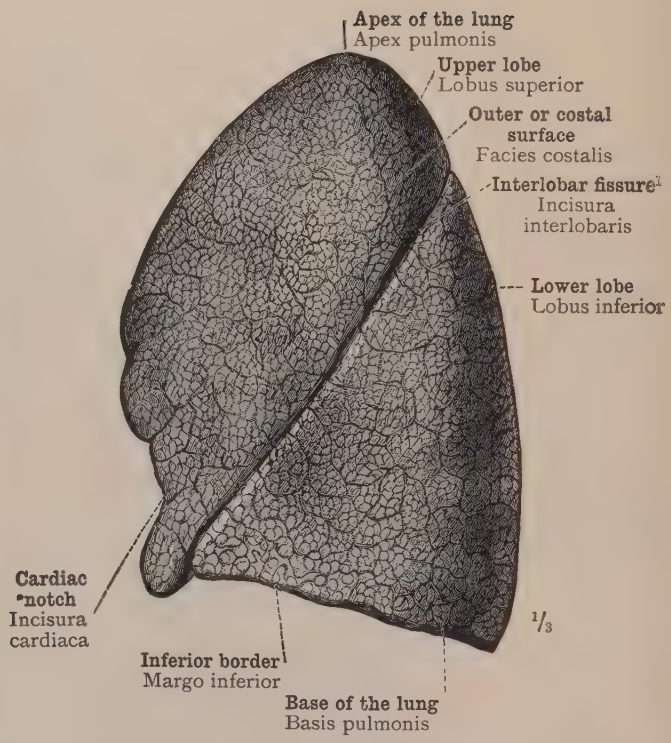


FIG. 785.—LEFT LUNG. OUTER OR COSTAL SURFACE.

[1] *Fissures of the Lung.*—The single fissure of the left lung, and the lower, more oblique, of the two fissures of the right lung, are sometimes distinguished as *great fissures* from the upper, nearly horizontal fissure of the right lung, which may be called the *supplementary fissure.*—TR.

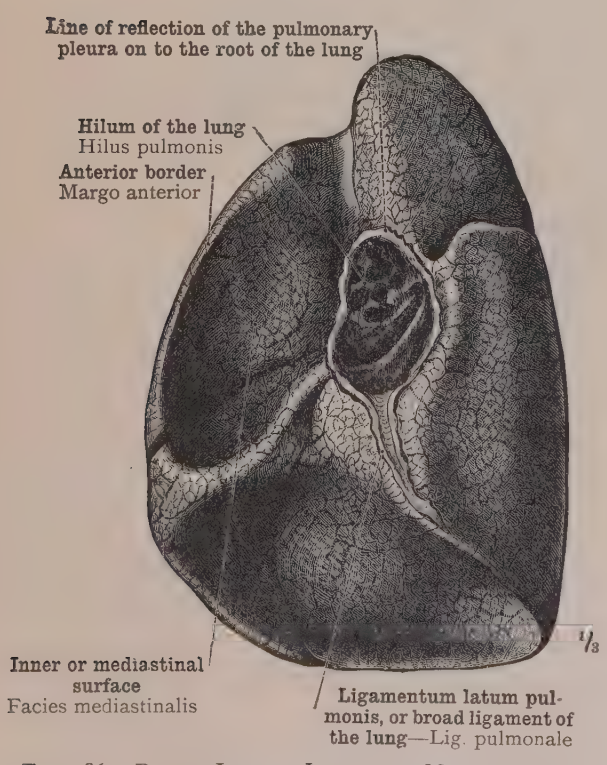

Line of reflection of the pulmonary pleura on to the root of the lung
Hilum of the lung
Hilus pulmonis
Anterior border
Margo anterior
1/3
Inner or mediastinal surface
Facies mediastinalis
Ligamentum latum pulmonis, or broad ligament of the lung—Lig. pulmonale

FIG. 786.—RIGHT LUNG. INNER OR MEDIASTINAL SURFACE, WITH THE HILUM LAID BARE BY THE REMOVAL OF THE STRUCTURES FORMING THE ROOT OF THE LUNG.

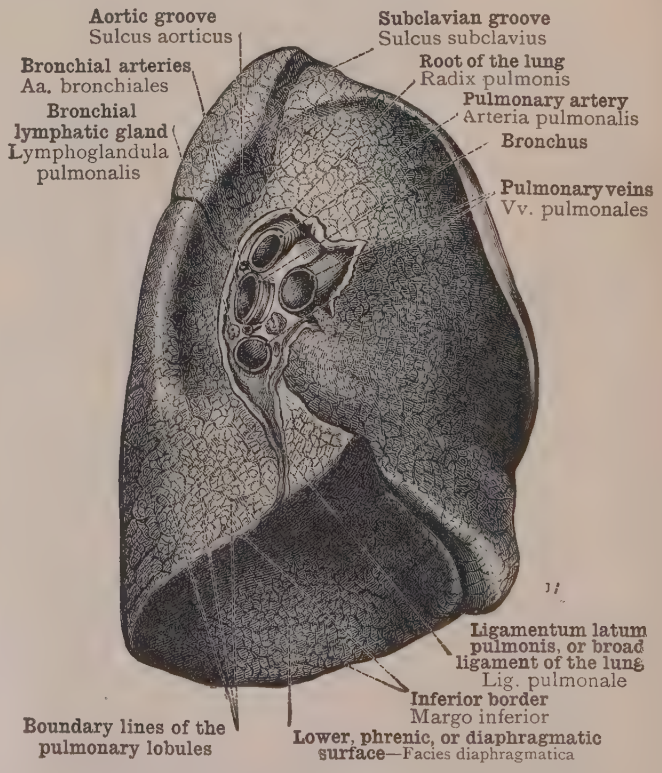
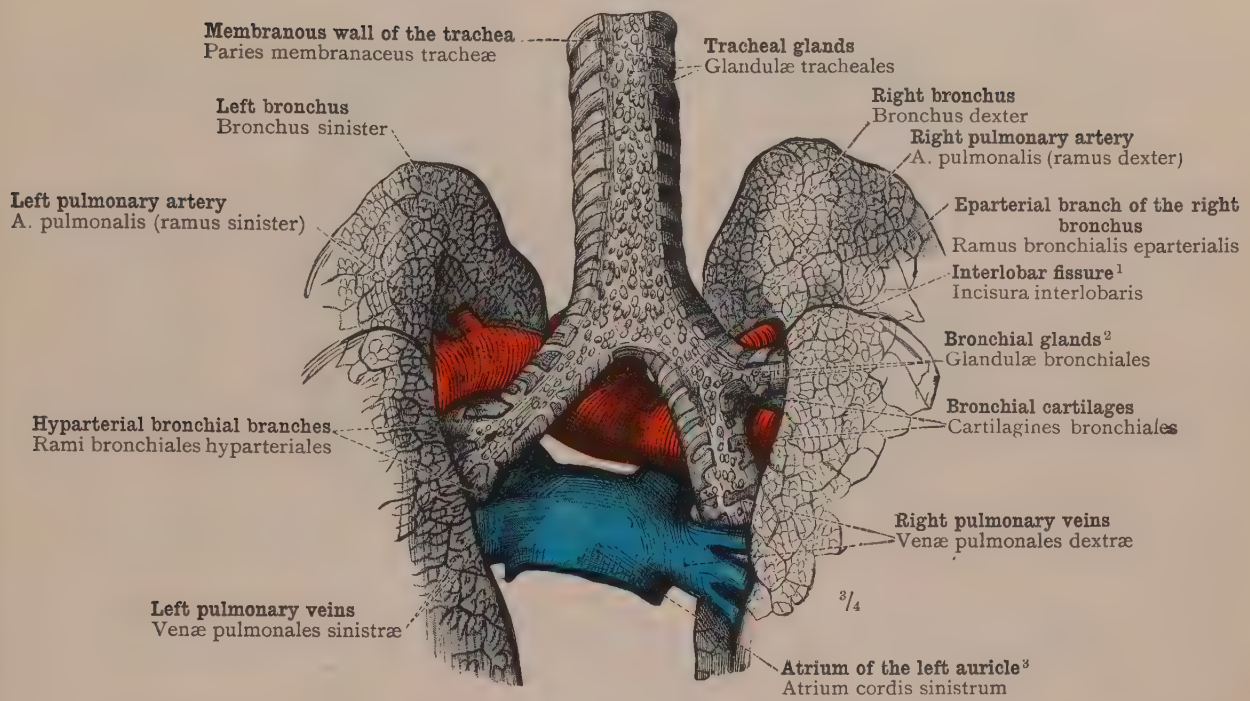


FIG. 787.—LEFT LUNG. INNER OR MEDIASTINAL SURFACE, WITH THE ROOT OF THE LUNG CUT ACROSS.



[1] See note [1] to p. 464.
[2] *Bronchial Glands.*—These are small mucous glands in the walls of the bronchi, and must not be confounded with the *bronchial lymphatic glands.*—Tr.
[3] See note 3 to p. 411.

FIG. 788.—ROOTS OF THE LUNGS, RADICES PULMONUM, SEEN FROM BEHIND. MUTUAL RELATIONS OF THE PULMONARY ARTERY, THE PULMONARY VEINS, THE MAIN BRONCHIAL TRUNK, AND THE PRIMARY BRONCHIAL BRANCHES, AS THEY ENTER THE HILUM OF EACH LUNG.

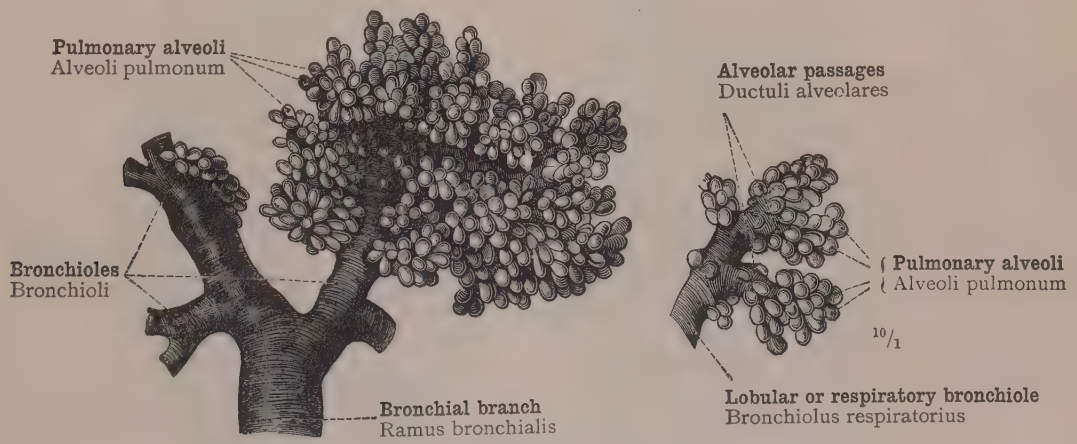


FIG. 789.—ULTIMATE EXTREMITIES OF THE AIR-PASSAGES.

After filling the bronchial ramification with resin, the lung tissue surrounding the air-passages was removed by maceration in hydrochloric acid.

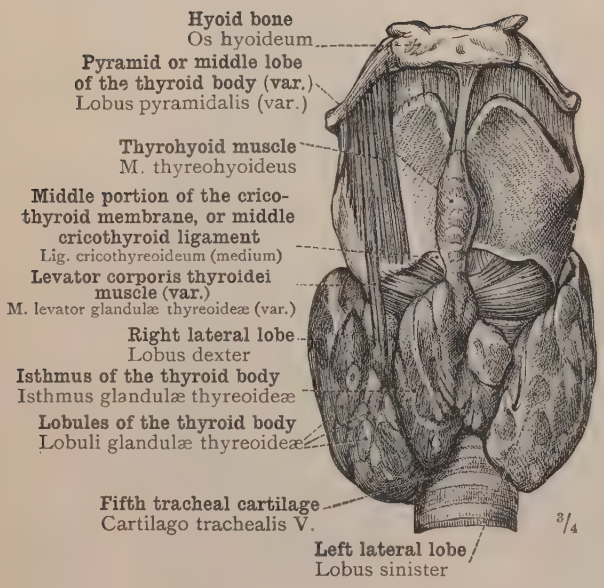


FIG. 790.—GLANDULA THYREOIDEA, THE THYROID BODY, WITH THE LARYNX AND TRACHEA, SEEN FROM BEFORE.

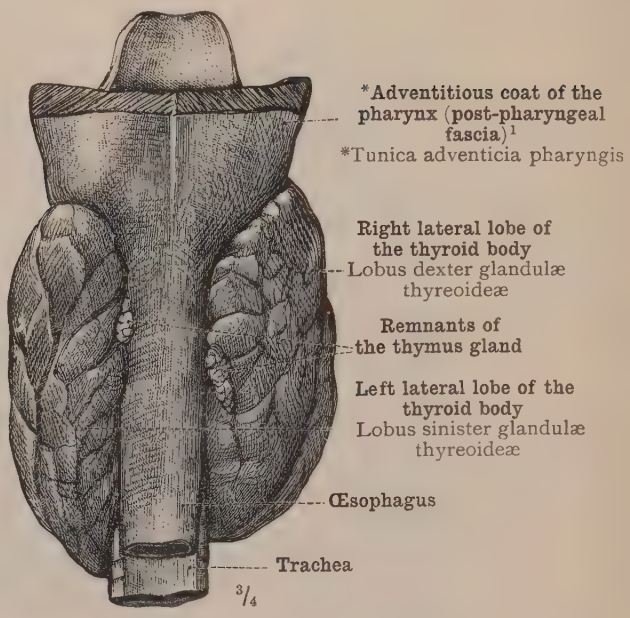

*Adventitious coat of the pharynx (post-pharyngeal fascia)[1]
*Tunica adventicia pharyngis
Right lateral lobe of the thyroid body
Lobus dexter glandulæ thyreoideæ
Remnants of the thymus gland
Left lateral lobe of the thyroid body
Lobus sinister glandulæ thyreoideæ
Œsophagus
Trachea
3/4

FIG. 791.—THE THYROID BODY, WITH THE ŒSOPHAGUS, SEEN FROM BEHIND.

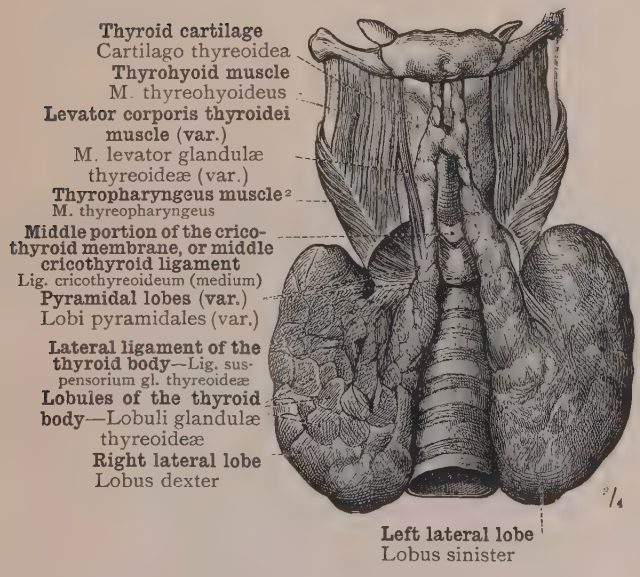


FIG. 792.—GLANDULA THYREOIDEA, THE THYROID BODY, WITH THE ISTHMUS WANTING, AND WITH BILATERAL PYRAMIDAL LOBES (VARIETY).

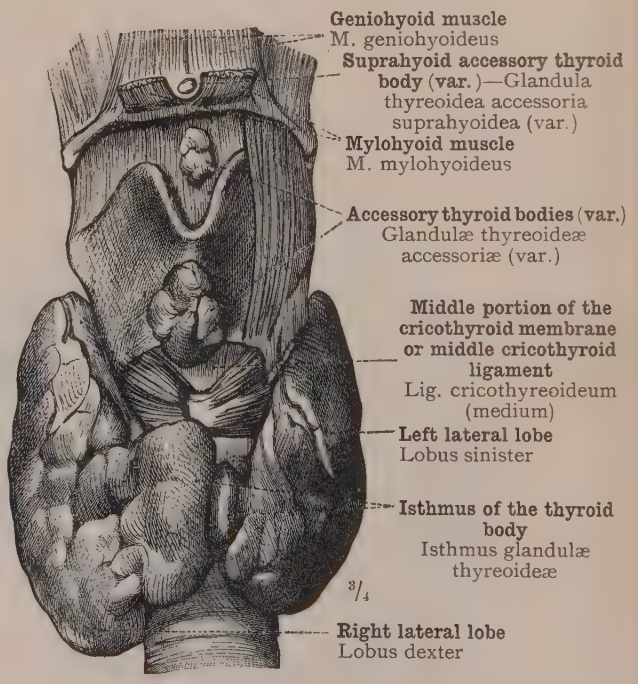


FIG. 793.—THYROID BODY WITH SEVERAL ACCESSORY THYROIDS; ONE OF THE LATTER IS SITUATE ABOVE THE HYOID BONE, BEHIND THE MYLOHYOID MUSCLE.

[1] See Appendix, note 34

[2] See note [1] to p. 433.

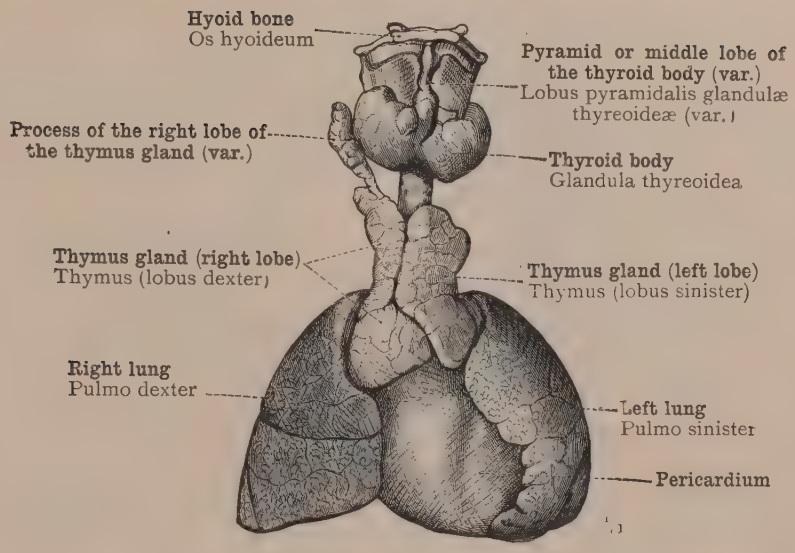
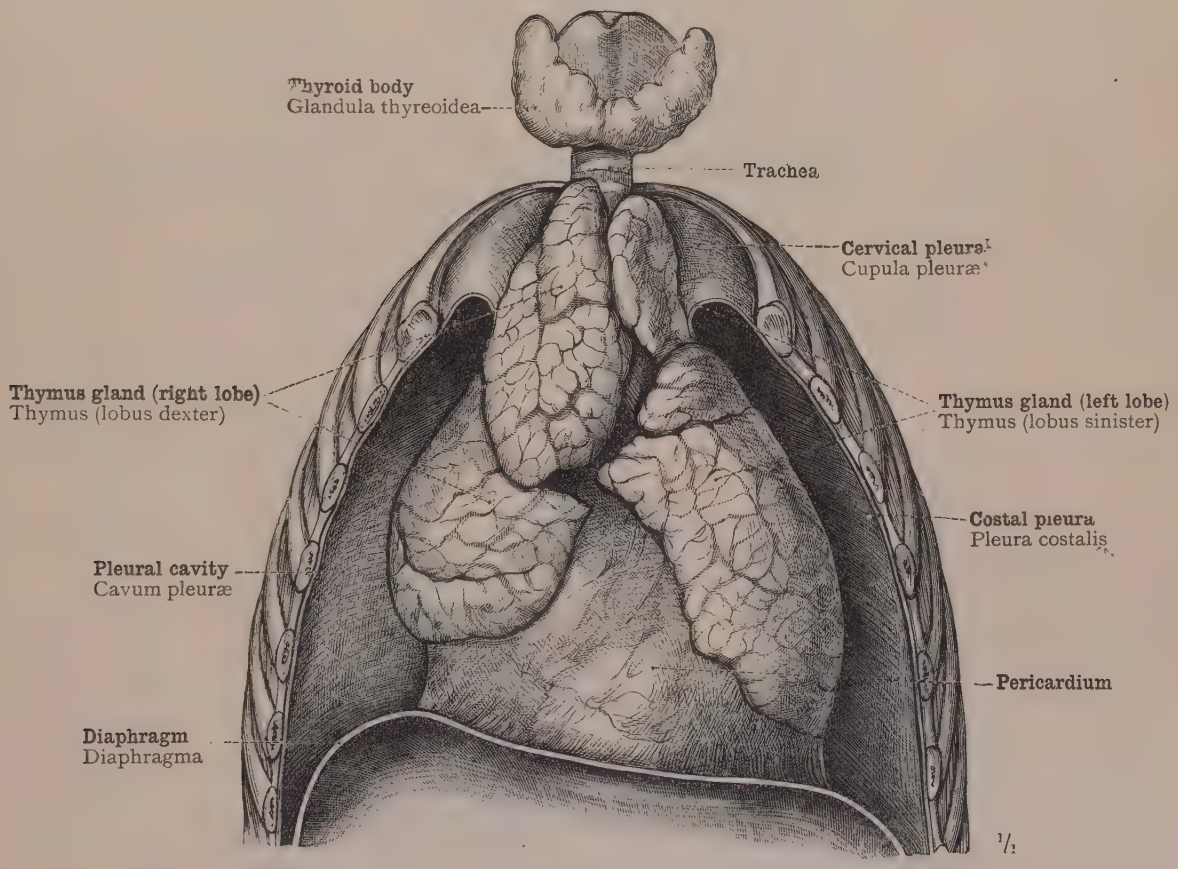


FIG. 794.—THE THYMUS GLAND, WITH THE THYROID BODY, THE PERICARDIUM, AND THE LUNGS, OF A HUMAN FŒTUS IN THE SIXTH MONTH OF INTRA-UTERINE LIFE (MONTHS OF FOUR WEEKS EACH). SEEN FROM BEFORE.



[1] *Cupula Pleuræ.*—This term is applied by the author to the dome-shaped summit of the pleura, but as this portion of the pleura projects through the superior aperture of the thorax into the root of the neck, it is generally known in England as the *cervical pleura.*—TR.

FIG. 795.—THE THYMUS GLAND, WITH THE PERICARDIUM, AS SEEN FROM BEFORE AFTER THE LUNGS HAVE BEEN ENTIRELY REMOVED. FROM A BOY AGED FIVE WEEKS.

The Thymus Gland.

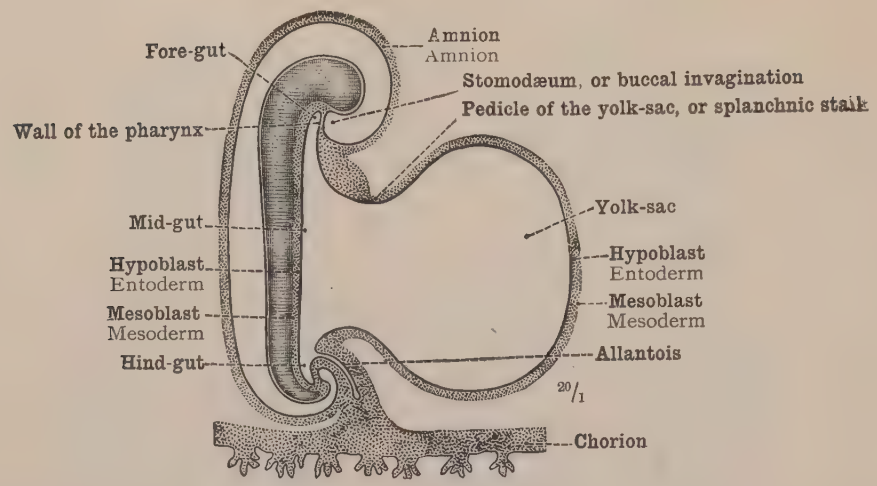


FIG. 796.—HUMAN EMBRYO IN THE BEGINNING OF THE THIRD WEEK (DIAGRAMMATIC).

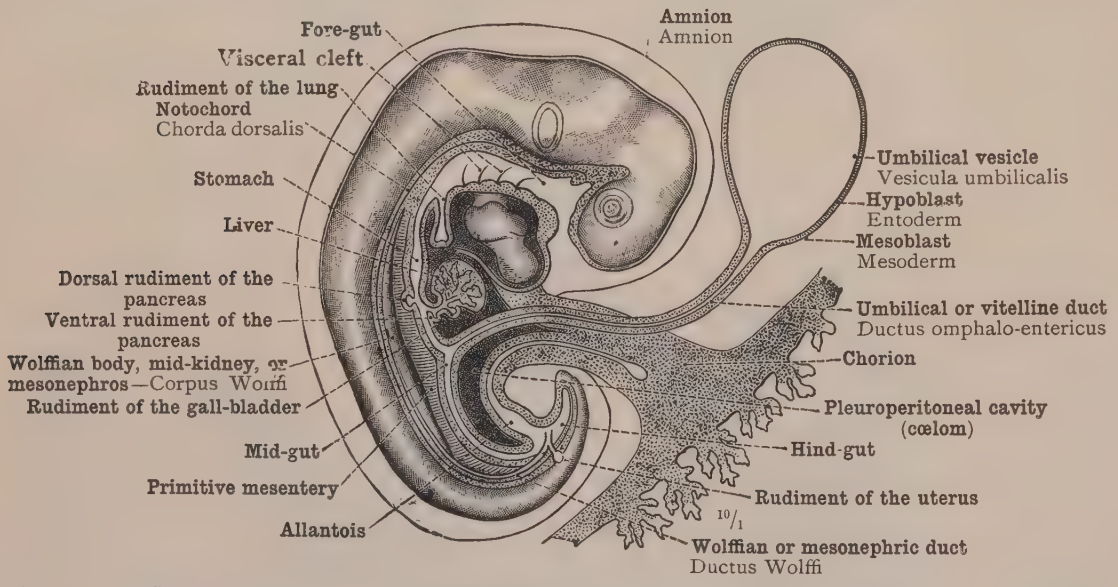


FIG. 797.—HUMAN EMBRYO IN THE BEGINNING OF THE FIFTH WEEK (DIAGRAMMATIC).

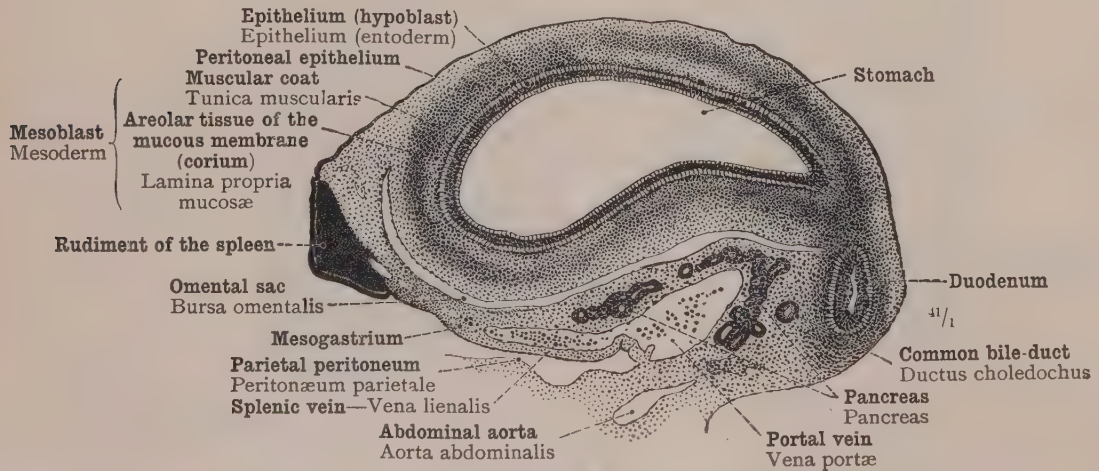
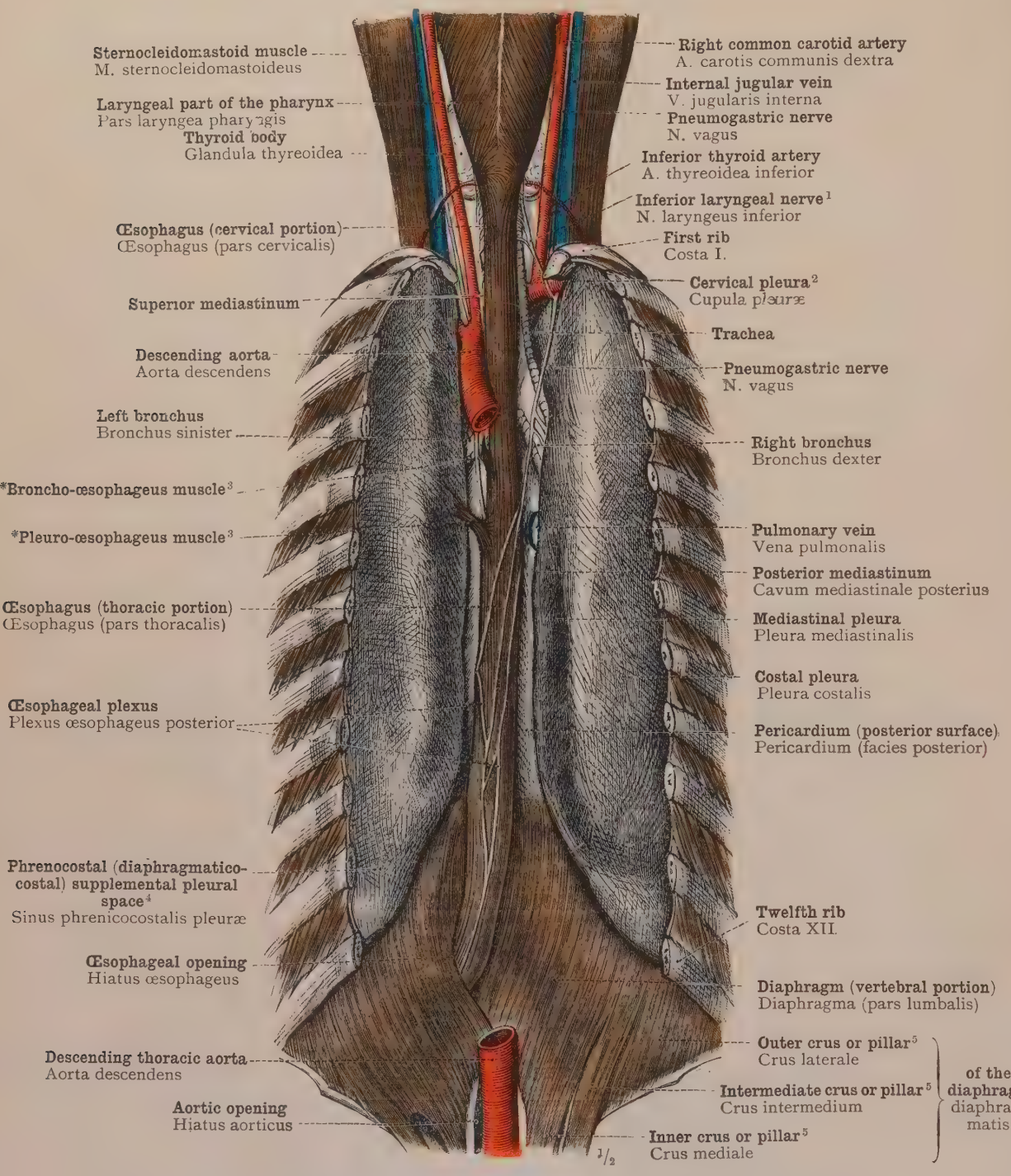


FIG. 798.—RUDIMENT OF THE SPLEEN. HUMAN EMBRYO IN THE SIXTH WEEK. TRANSVERSE SECTION.

TOPOGRAPHICAL ANATOMY

OF THE

THORACIC AND ABDOMINAL VISCERA



[1] Known also as the *recurrent laryngeal nerve.*
[2] See note [1] to p. 467.
[3] See Appendix, note 35.
[4] See Appendix, note 36.
[5] See Appendix, note 37.

FIG. 799.—COURSE OF THE THORACIC PORTION OF THE ŒSOPHAGUS IN THE POSTERIOR MEDIASTINUM, AND ITS PASSAGE THROUGH THE ŒSOPHAGEAL OPENING IN THE DIAPHRAGM. THE ŒSOPHAGUS IS SEEN FROM BEHIND, HAVING BEEN EXPOSED BY THE REMOVAL OF THE VERTEBRAL COLUMN, THE POSTERIOR EXTREMITIES OF THE RIBS, AND THE GREATER PART OF THE DESCENDING THORACIC AORTA. BRONCHO-ŒSOPHAGEUS AND PLEURO-ŒSOPHAGEUS MUSCLES.

The pleura has been left intact.

Topographical Anatomy of the Œsophagus.

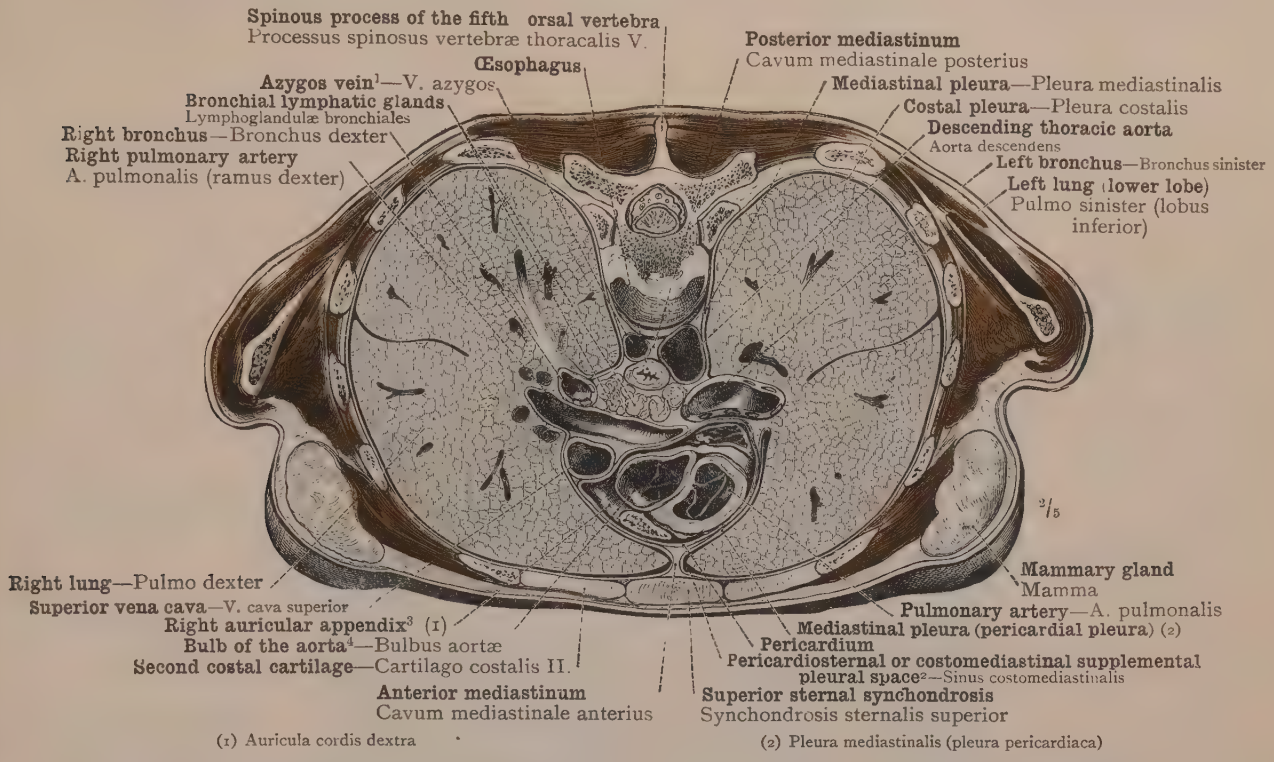


FIG. 800.—HORIZONTAL SECTION THROUGH THE TRUNK PASSING BETWEEN THE BODIES OF THE FIFTH AND SIXTH DORSAL VERTEBRÆ.

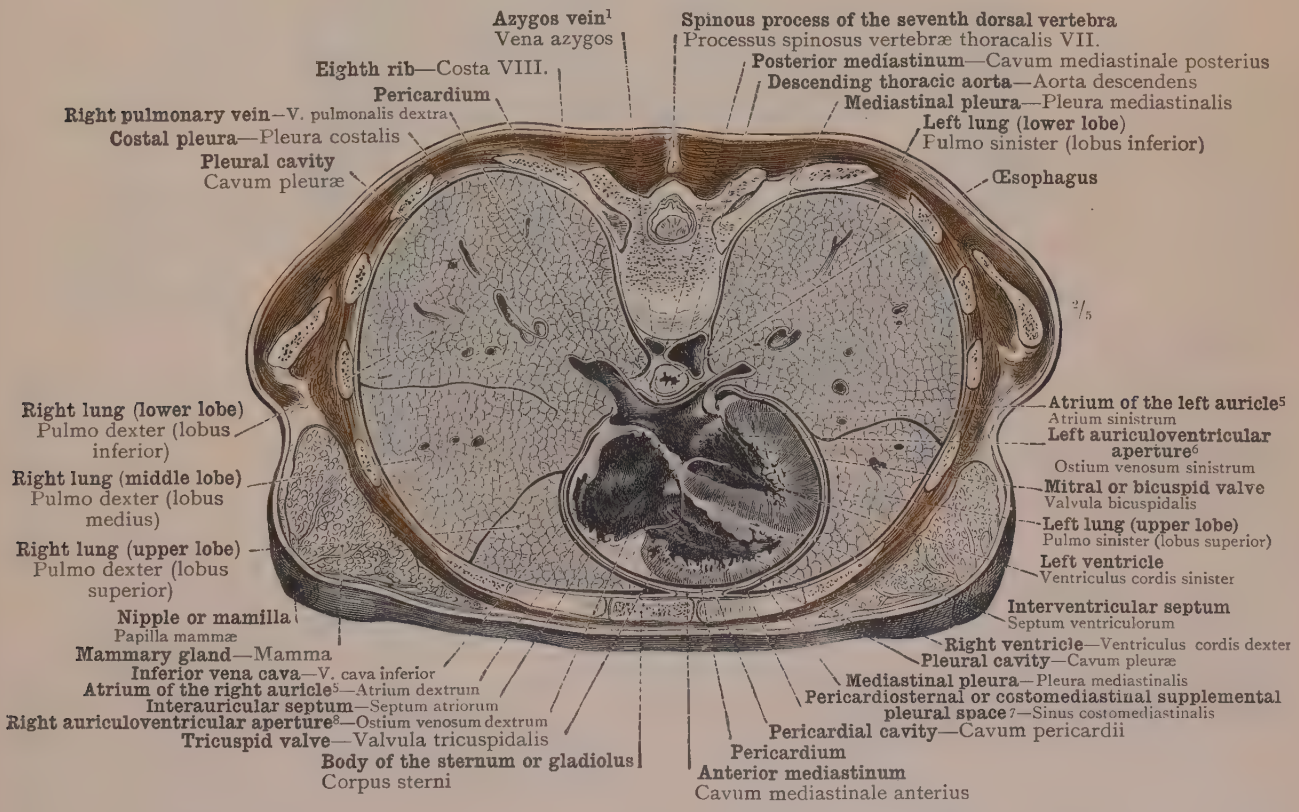
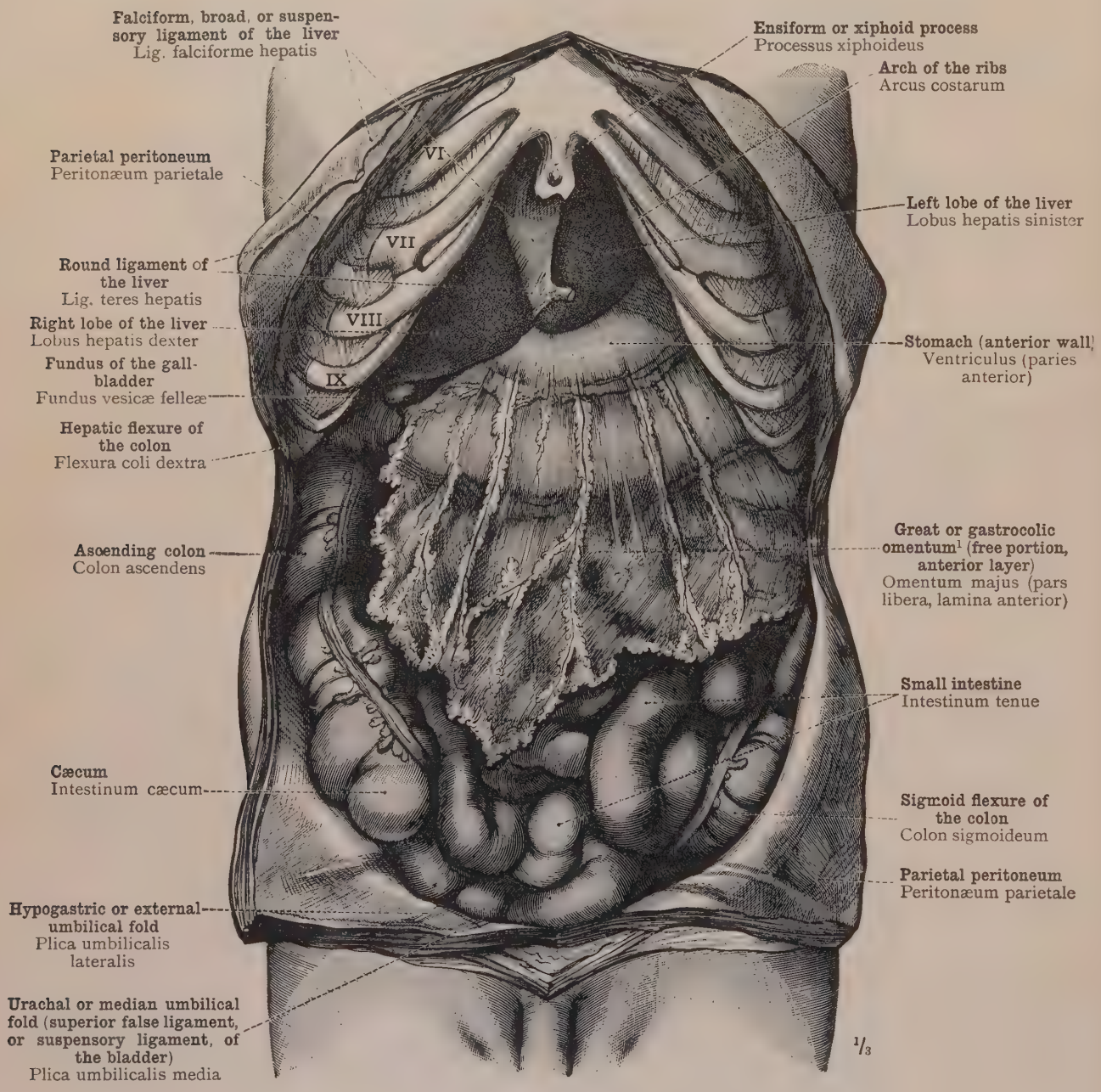


FIG. 801.—HORIZONTAL SECTION THROUGH THE TRUNK PASSING BETWEEN THE BODIES OF THE SEVENTH AND EIGHTH DORSAL VERTEBRÆ.

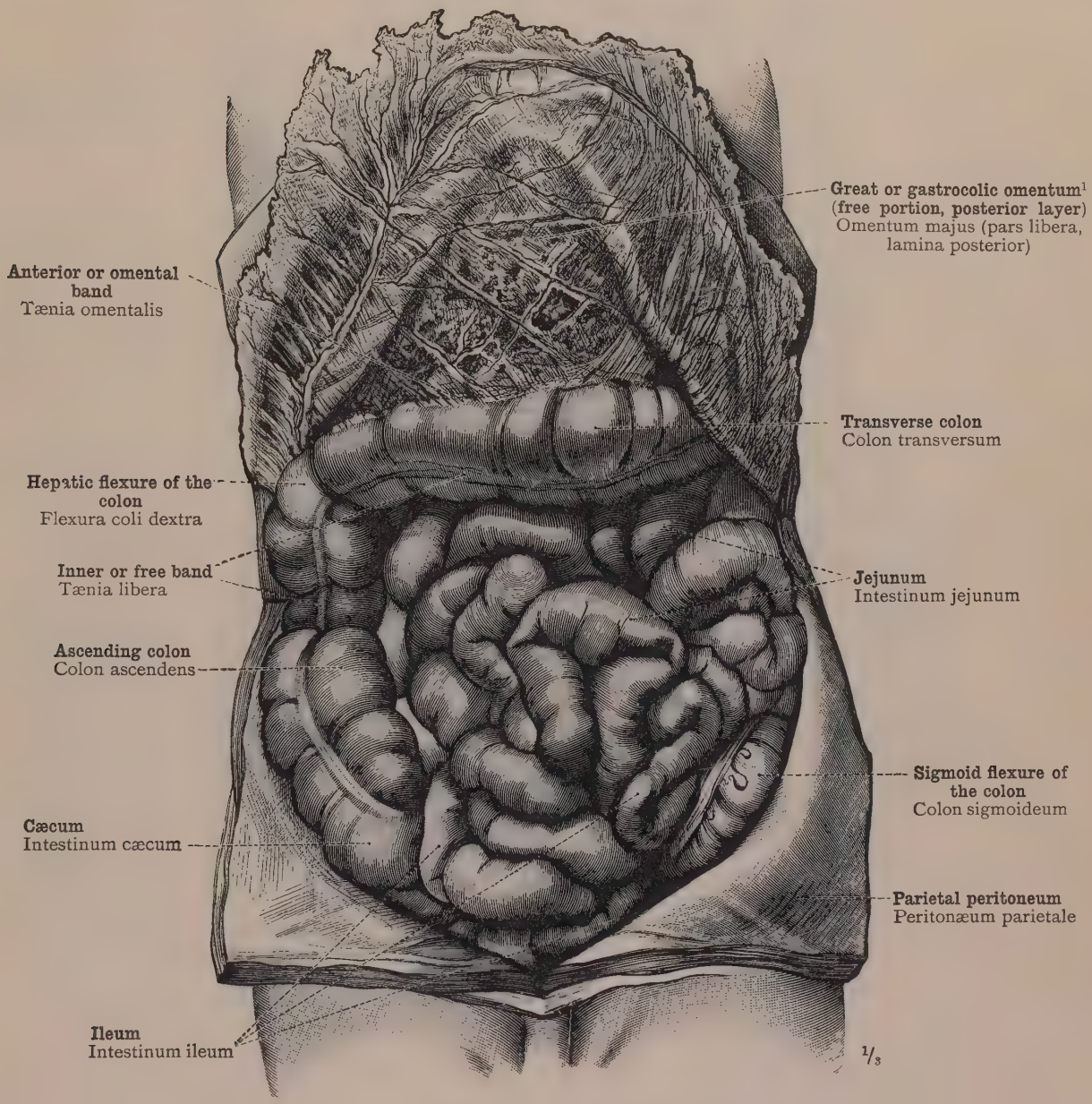
[1] Sometimes called the *right* or *large azygos vein*. [2] See Appendix, note 36. [3] See note 3 to p. 411. [4] See Appendix, note 38.
[5] See note 3 to p. 411. [6] Or *mitral orifice*. [7] See Appendix, note 36. [8] Or *tricuspid orifice*.



[1] Or *epiploon*. See note [2] to p. 456.

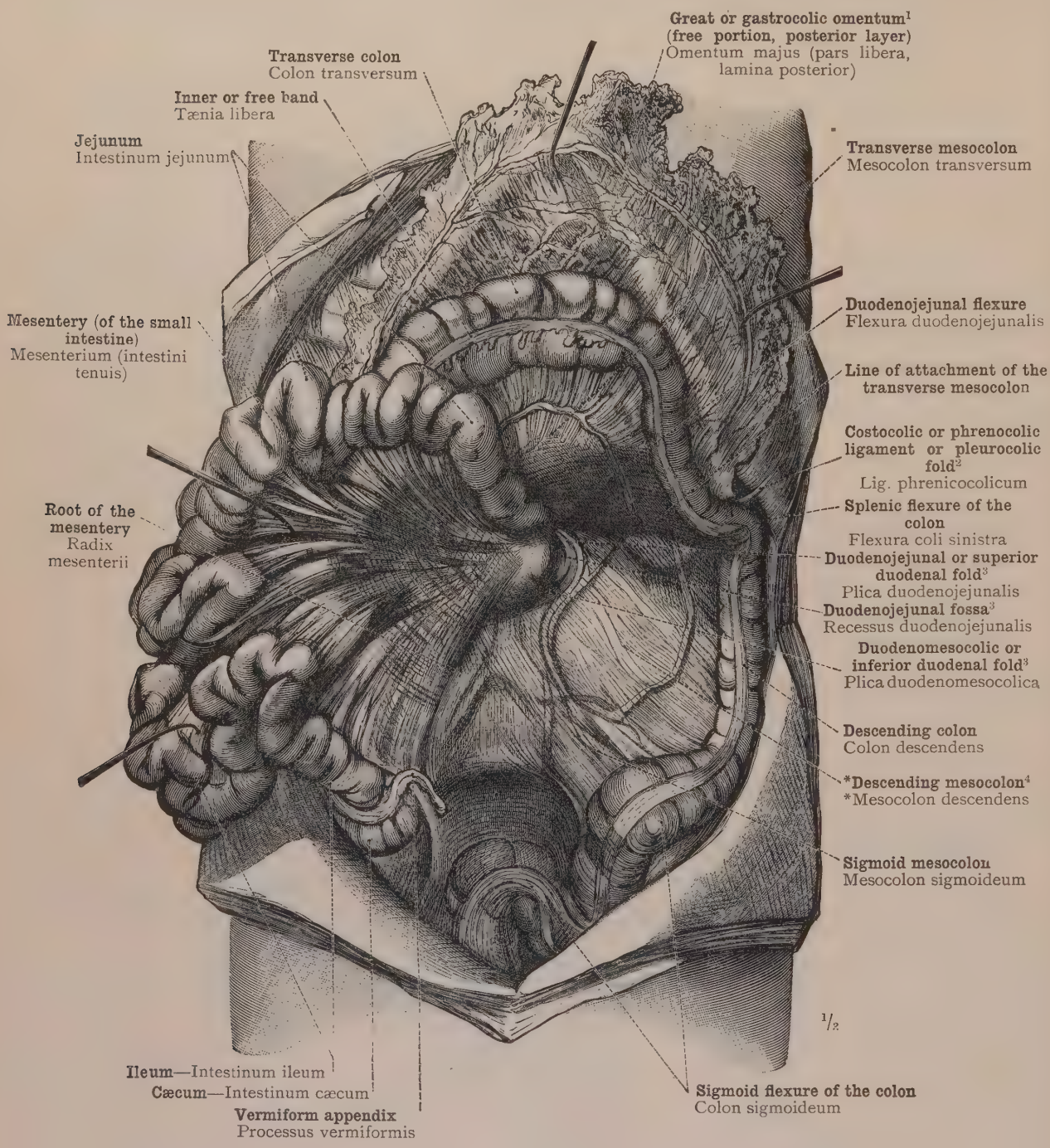
FIG. 802.—POSITION OF THE ABDOMINAL VISCERA AS SEEN AFTER THE ABDOMINAL CAVITY HAS BEEN OPENED IN THE USUAL MANNER AND THE COSTAL ARCHES HAVE BEEN LAID BARE.

The visible portions of the large intestine (colon) are moderately distended with gas ; the great or gastrocolic omentum (omentum majus) is in its natural position.



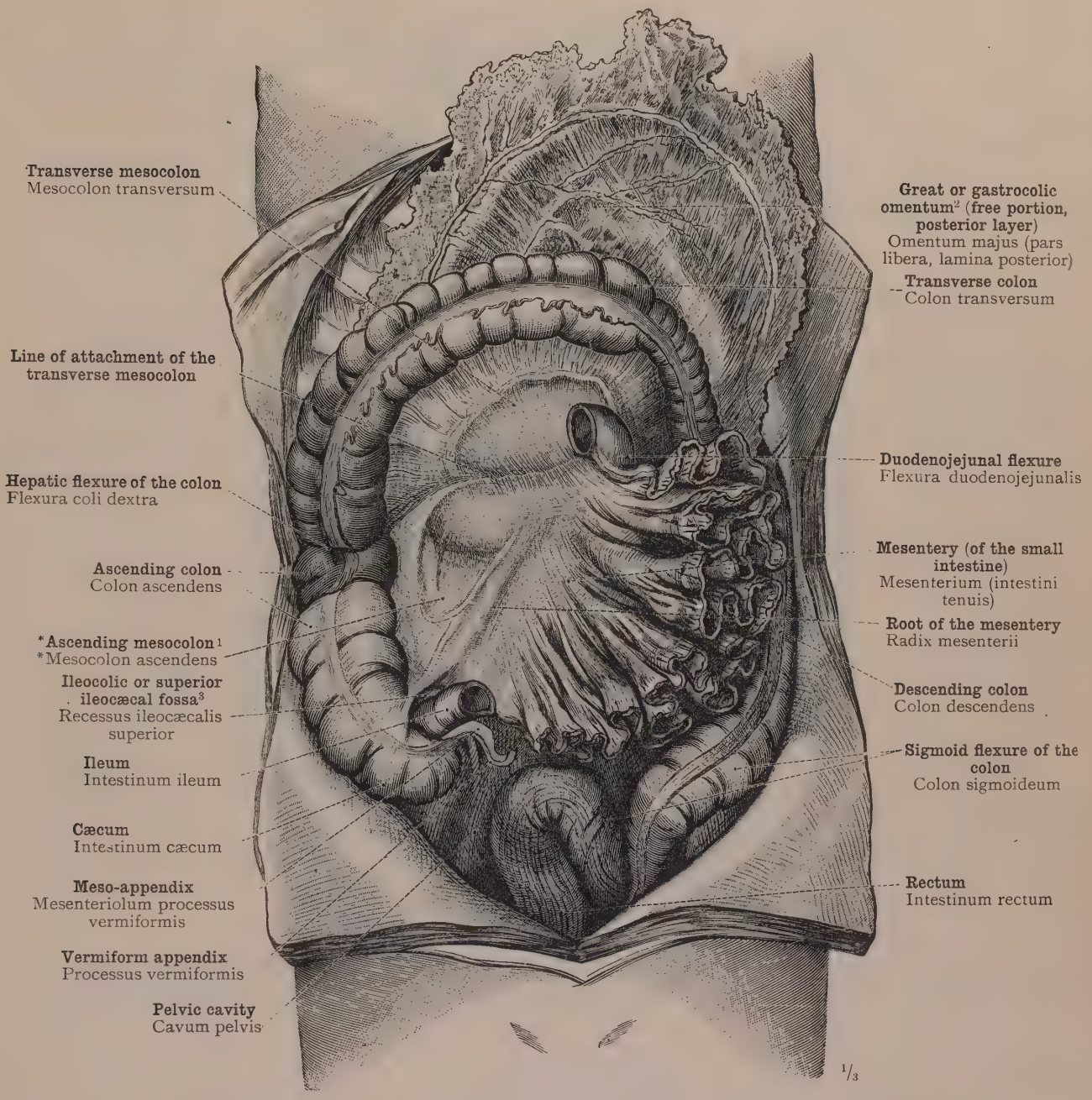
[1] Or *epiploon*. See note [2] to p. 456.

FIG. 803.—POSITION OF THE VISCERA IN THE LOWER PORTION OF THE ABDOMINAL CAVITY, AFTER THE GREAT OR GASTROCOLIC OMENTUM HAS BEEN TURNED UPWARDS. RELATION OF THE GREAT OMENTUM TO THE TRANSVERSE COLON (COLON TRANSVERSUM); POSITION OF THE CÆCUM (INTESTINUM CÆCUM) AND OF THE ASCENDING COLON (COLON ASCENDENS) IN RELATION TO THE LOOPS OF THE FREE PORTIONS OF THE SMALL INTESTINE (INTESTINUM TENUE): JEJUNUM (INTESTINUM JEJUNUM) AND ILEUM (INTESTINUM ILEUM).



1 Or *epiploon*. See note 2 to p. 456.
2 Known also as *sustentaculum lienis*. See Appendix, note 41.
3 See Fig. 757 on p. 454 and Appendix, note 20.
4 See note 1 to p. 453.

FIG. 804.—THE FREE PORTIONS OF THE SMALL INTESTINE (INTESTINUM TENUE), THE JEJUNUM (INTESTINUM JEJUNUM), AND THE ILEUM (INTESTINUM ILEUM), HAVE BEEN TURNED AS FAR AS POSSIBLE TO THE RIGHT, AND THE TRANSVERSE COLON (COLON TRANSVERSUM) HAS BEEN DRAWN UPWARDS, TO SHOW THE TRANSITION OF THE LATTER INTO THE DESCENDING COLON (COLON DESCENDENS), AND OF THE DESCENDING COLON INTO THE SIGMOID FLEXURE OF THE COLON (COLON SIGMOIDEUM). THE MESENTERY AND ITS ROOT (MESENTERIUM ET RADIX MESENTERII) ARE SEEN FROM THE LEFT SIDE. OF THE MESENTERY OF THE LARGE INTESTINE, OR MESOCOLON, THE LEFT HALF OF THE TRANSVERSE MESOCOLON WITH ITS LINE OF ATTACHMENT, THE *DESCENDING MESOCOLON (*see note 4 above*), AND THE SIGMOID MESOCOLON ARE VISIBLE. RECESSUS DUODENOJEJUNALIS, DUODENOJEJUNAL FOSSA (*see note 3 above*).

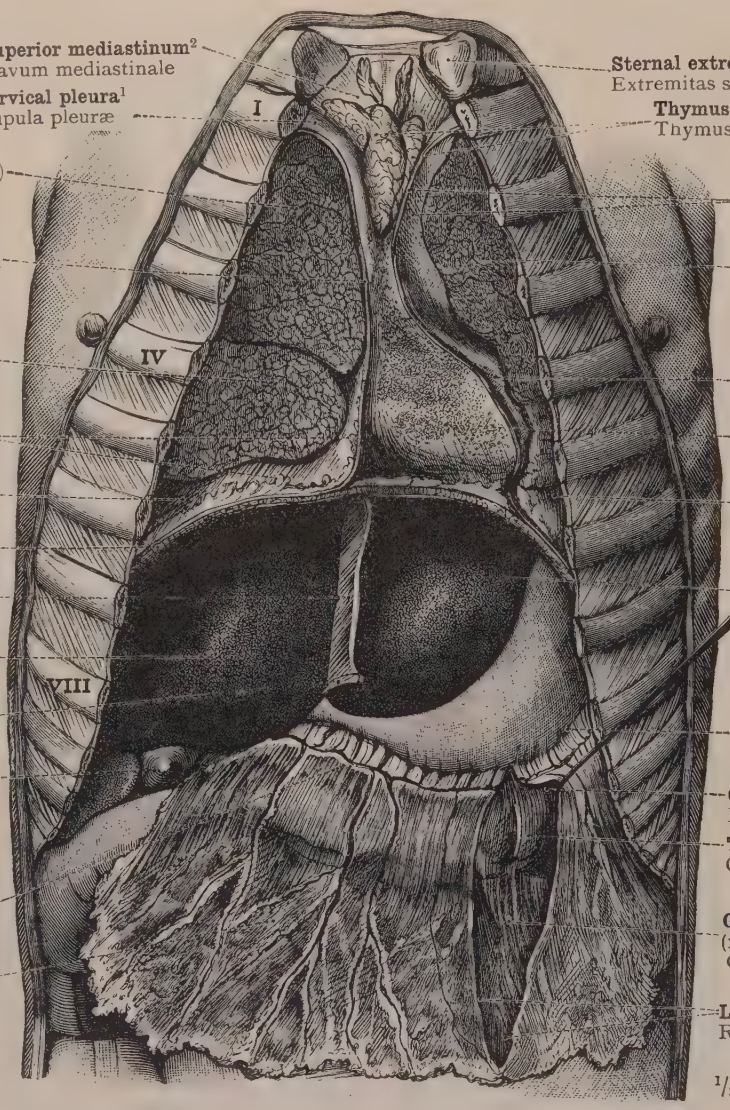


[1] See Appendix, note [39].

[2] Or *epiploon*. See note [2] to p. 456.

[3] See Appendix, note [23].

FIG. 805.—THE FREELY-MOVABLE PORTION OF THE SMALL INTESTINE HAS, WITH THE EXCEPTION OF THE COMMENCEMENT OF THE JEJUNUM AND THE TERMINATION OF THE ILEUM, BEEN CUT AWAY FROM THE MESENTERY, AND THIS LATTER HAS BEEN TURNED TO THE LEFT. THE MESENTERY AND ITS ROOT (MESENTERIUM ET RADIX MESENTERII) ARE SEEN FROM THE RIGHT SIDE. OF THE MESENTERY OF THE LARGE INTESTINE, OR MESOCOLON, THE RIGHT PORTION OF THE TRANSVERSE MESOCOLON WITH ITS LINE OF ATTACHMENT, AND THE *ASCENDING MESOCOLON (*see Appendix, note* [39]) ARE VISIBLE. RECESSUS ILEOCÆCALIS SUPERIOR, ILEOCOLIC OR SUPERIOR ILEOCÆCAL FOSSA (*see Appendix, note* [23]). INTESTINUM CÆCUM, THE CÆCUM; COLON ASCENDENS, THE ASCENDING COLON; COLON TRANSVERSUM, THE TRANSVERSE COLON; COLON SIGMOIDEUM, THE SIGMOID FLEXURE OF THE COLON, AND ITS TRANSITION INTO THE RECTUM (INTESTINUM RECTUM).



[1] See note [1] to p. 467. [2] See note [2] to p. 410 and Appendix, note 24. [3] See Appendix, note 40. [4] Or *epiploon*. See note [2] to p. 456.

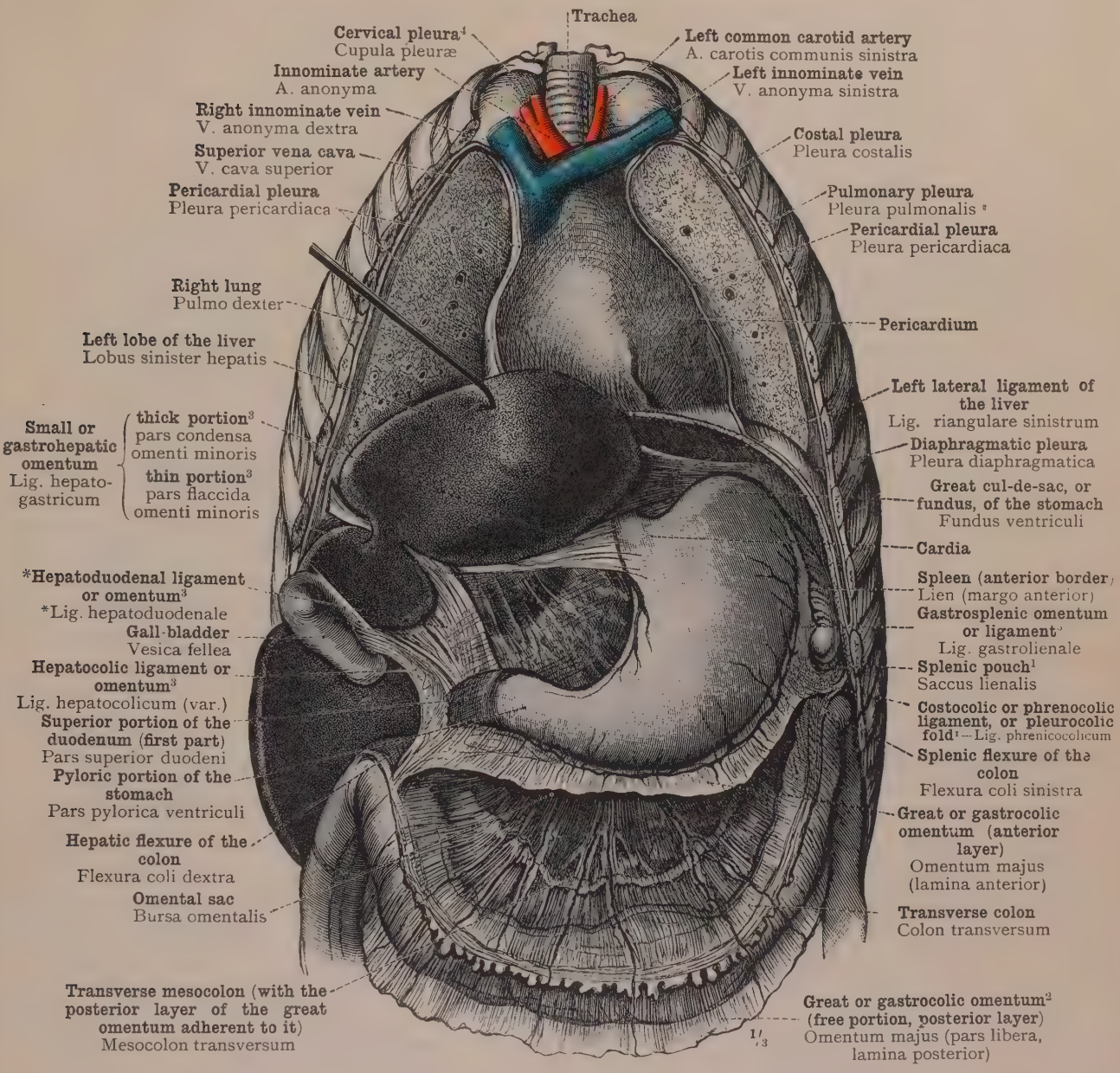
FIG. 806.—POSITION OF THE VISCERA IN THE THORACIC CAVITY AND THE UPPER PORTION OF THE ABDOMINAL CAVITY, AS SEEN AFTER THE REMOVAL OF THE ANTERIOR WALLS OF THE THORAX AND ABDOMEN.

The sternum, the costal cartilages, and the anterior extremities of the bodies or shafts of the ribs, have been removed.

CAVUM MEDIASTINALE ANTERIUS, THE ANTERIOR MEDIASTINUM—ANTERIOR AND SUPERIOR MEDIASTINA OF ENGLISH ANATOMISTS (*see note [2] above*)—WITH THE REMAINS OF THE THYMUS GLAND AND THE ANTERIOR WALL OF THE PERICARDIUM. LAMINÆ MEDIASTINALES, THE TWO LAYERS OF THE MEDIASTINUM. THE ANTERIOR BORDER AND A PORTION OF THE OUTER OR COSTAL SURFACE OF BOTH LUNGS. POSITION OF THE STOMACH IN RELATION TO THE LIVER AND THE TRANSVERSE COLON. GREAT OR GASTROCOLIC OMENTUM (OMENTUM MAJUS) SEEN FROM BEFORE.

The anterior layer of the great omentum, attached above to the great curvature of the stomach, has been divided by a vertical incision to the left of the middle line, and the margins of the incision have been drawn a little apart, in order to show the interior of the lower part of the omental sac (recessus inferior omentalis). Through the aperture thus made, a small portion of the transverse colon, and the posterior layer of the great omentum, are visible.

Topographical Anatomy of the Thoracic Organs and of the Viscera in the Upper Part of the Abdominal Cavity.

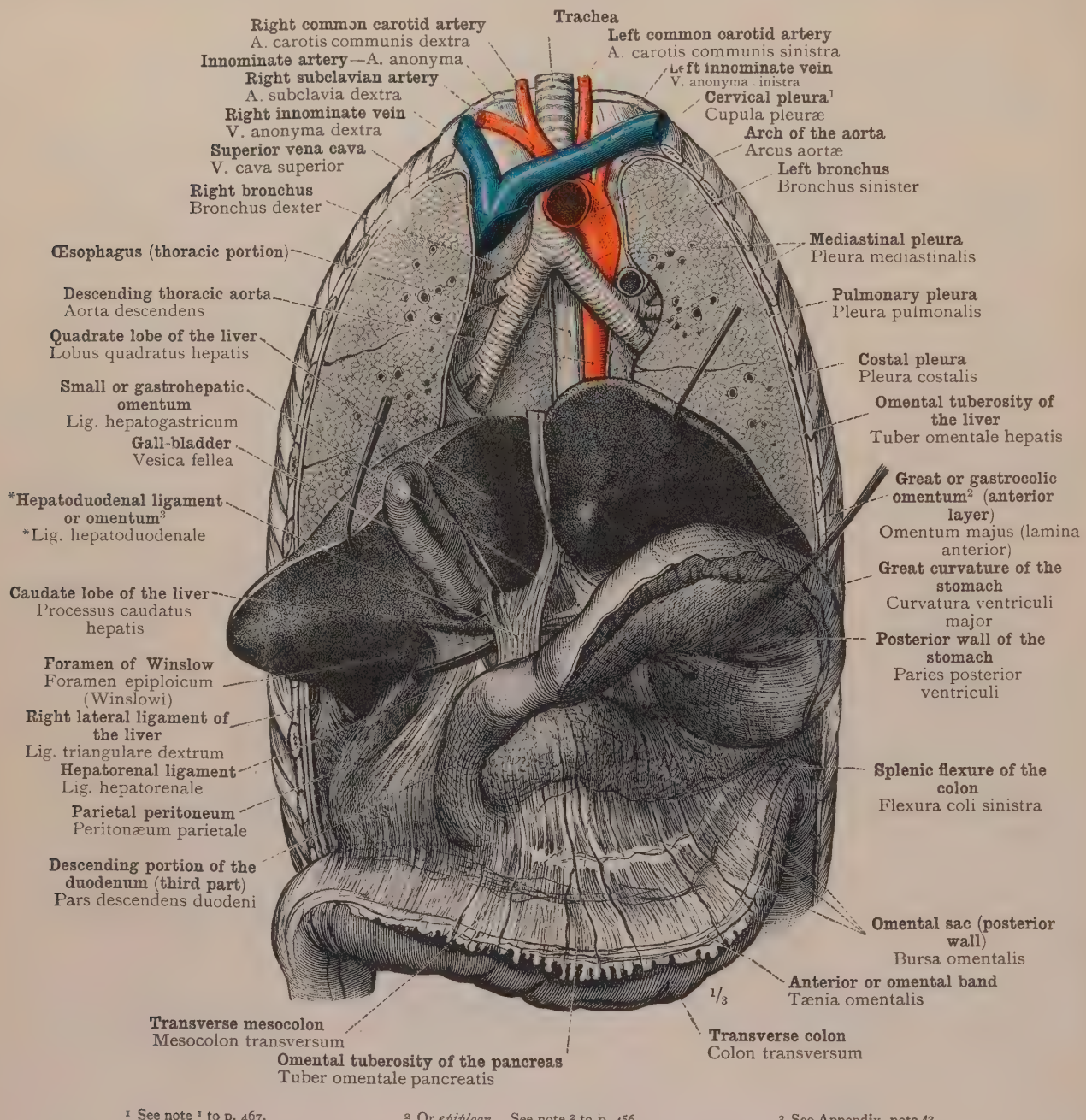


1 See Appendix, note 41.
2 Or *epiploon*. See note 2 to p. 456.
3 See Appendix, note 42.
4 See note 1 to p. 467.
5 This is connected below with the great omentum, and is often regarded as a part of it.—TR.

FIG. 807.—THE THORACIC ORGANS AND THE VISCERA IN THE UPPER PART OF THE ABDOMINAL CAVITY AS SEEN AFTER THE REMOVAL OF THE WHOLE OF THE ANTERIOR WALL OF THE THORAX AND ABDOMEN.

By means of a coronal section, the anterior portions of both lungs and of the two layers of the mediastinum have been removed, so that the greater part of the anterior surface of the pericardium is exposed to view. The various parts of the diaphragm and the pleura are seen in section. The liver has been drawn as far as possible to the right, in order to show the stomach in its natural position, and the small omentum, consisting of three portions (*see Appendix, note* 42); the Spigelian lobe of the liver (*lobus caudatus* according to Toldt—*see Appendix, note* 16) is visible through the thin portion of the small omentum. By the removal of the greater part of the anterior layer of the great or gastrocolic omentum, the posterior wall of the lower part of the omental sac has been exposed; this posterior wall is constituted by the posterior layer of the great omentum, and in part by the transverse mesocolon, adherent thereto.

Topographical Anatomy of the Thoracic Organs and of the Viscera in the Upper Part of the Abdominal Cavity.



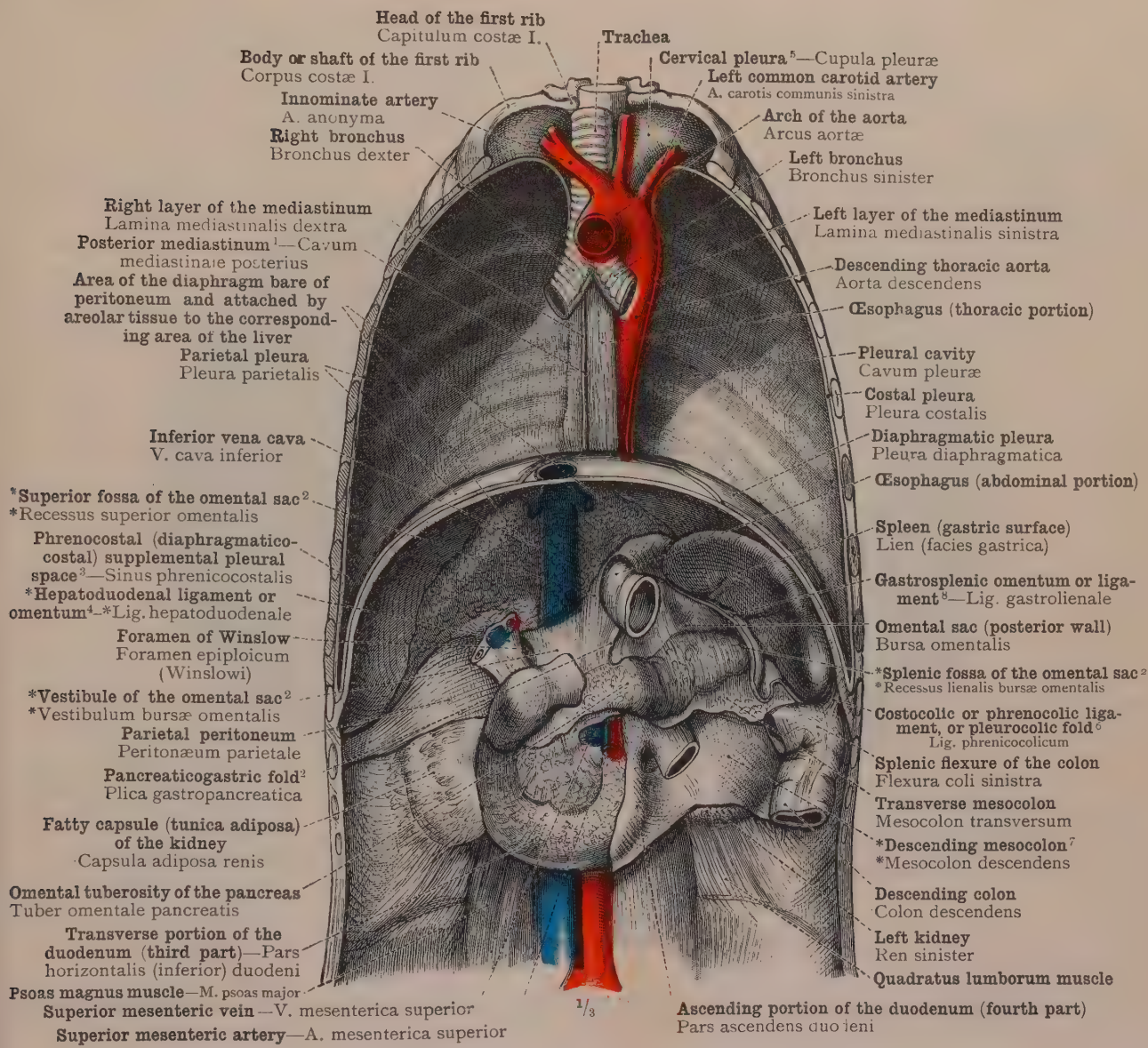
[1] See note [1] to p. 467. [2] Or *epiploon*. See note [2] to p. 456. [3] See Appendix, note 42.
[4] See Appendix, note 16. [5] See note [2] to p. 410 and Appendix, note 24.

FIG. 808.—THE THORACIC AND ABDOMINAL WALLS HAVE BEEN REMOVED AS FAR BACK AS THE AXILLARY LINE (*see Fig.* 818, *p.* 488). THE ANTERIOR PORTIONS OF BOTH LUNGS HAVE BEEN REMOVED IN FRONT OF THE HILUM, AND THE PERICARDIAL SAC AND THE HEART HAVE BEEN TAKEN AWAY, SO THAT THE HINDER PART OF THE MIDDLE AND SUPERIOR MEDIASTINA AND THE POSTERIOR MEDIASTINUM (*see note* [5] *above*) ARE SEEN FROM THE FRONT, AND THE BRONCHIAL RAMIFICATION, THE ŒSOPHAGUS, AND THE DESCENDING THORACIC AORTA, ARE PARTIALLY DISPLAYED.

THE FREE PORTION OF THE GREAT OR GASTROCOLIC OMENTUM HAVING BEEN CUT AWAY BY INCISIONS PASSING ALONG ITS ATTACHMENTS TO THE GREAT CURVATURE OF THE STOMACH AND TO THE TRANSVERSE COLON, THE LIVER AND THE STOMACH WERE DRAWN UPWARDS AS FAR AS POSSIBLE, IN ORDER TO SHOW THE ENTRANCE TO THE OMENTAL SAC BY MEANS OF THE FORAMEN OF WINSLOW (FORAMEN EPIPLOICUM WINSLOWI), AND THE INTERIOR OF THE OMENTAL SAC (BURSA OMENTALIS), THE POSTERIOR WALL OF WHICH IS TO A LARGE EXTENT LAID BARE; IN THIS AREA, AND COVERED BY THE POSTERIOR LAYER OF THE GREAT OMENTUM, THE PANCREAS IS VISIBLE.

A sound has been passed through the foramen of Winslow into the omental sac.

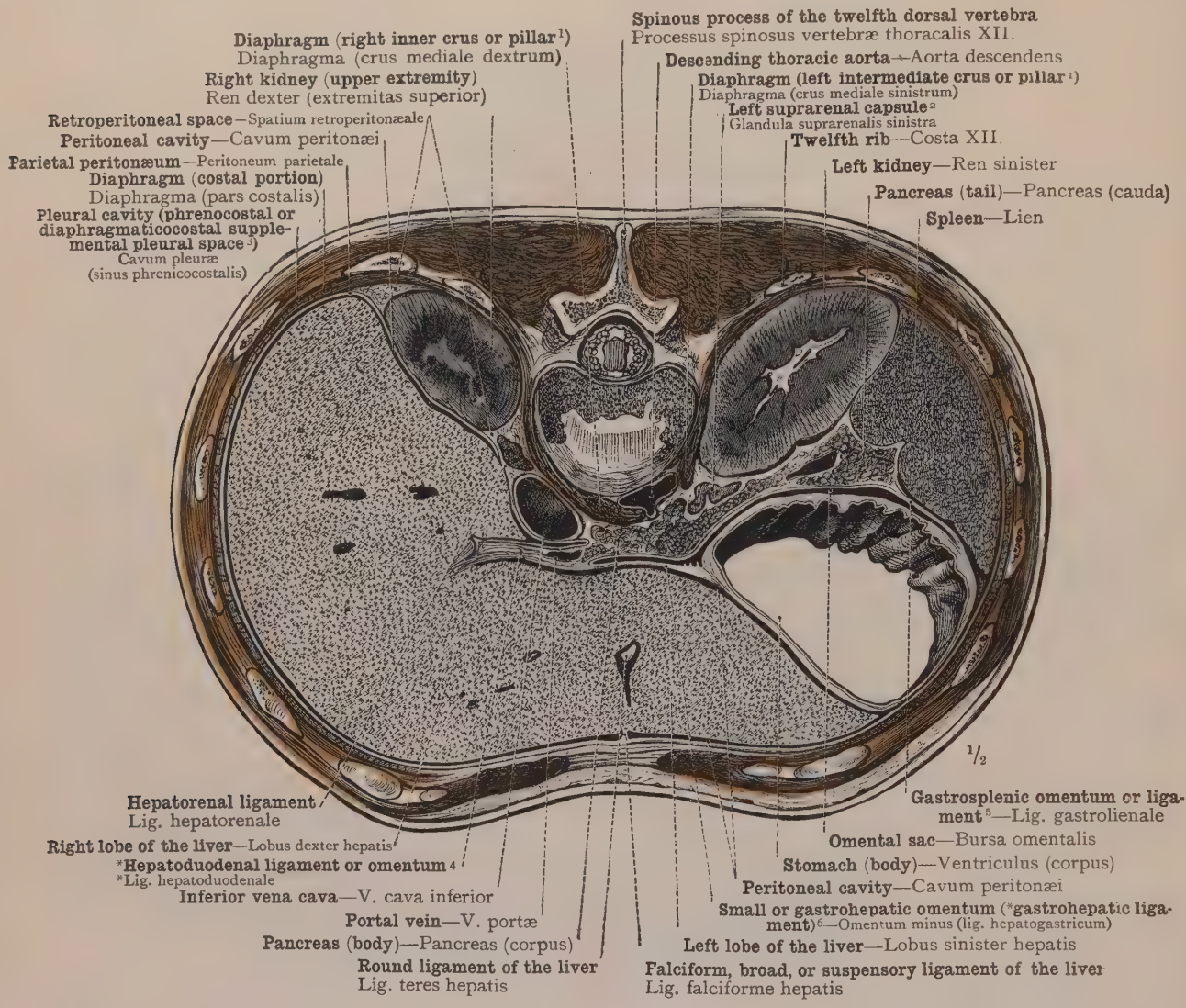
Topographical Anatomy of the Thoracic Organs and of the Viscera in the Upper Part of the Abdominal Cavity.



1 See Appendix, note 43. 2 See Appendix, note 44. 3 See Appendix note 36. 4 See Appendix, note 42.
5 See note [1] to p. 467. 6 See Appendix, note 41. 7 See note [1] to p. 453. 8 See Appendix, note 45.

FIG. 809.—THE THORACIC AND ABDOMINAL WALLS HAVE BEEN REMOVED AS FAR BACK AS THE AXILLARY LINE (*see Fig.* 818, *p.* 488). THE PERICARDIUM, THE HEART, AND THE LUNGS HAVE BEEN COMPLETELY REMOVED, SO THAT THE TWO PLEURAL CAVITIES COVERED BY THE COSTAL (PARIETAL) PLEURA, AND BETWEEN THESE THE POSTERIOR MEDIASTINUM AND THE POSTERIOR PART OF THE SUPERIOR MEDIASTINUM, ARE SEEN. THE LIVER, THE STOMACH, AND THE GREATER PART OF THE INTESTINE HAVE BEEN REMOVED, IN ORDER TO SHOW THE MUTUAL RELATIONS OF THE DUODENUM, THE PANCREAS, AND THE SPLEEN. THE POSTERIOR WALL OF THE *VESTIBULE OF THE OMENTAL SAC, CONSISTING OF PARIETAL PERITONEUM, AND THE POSTERIOR WALL OF THE OMENTAL SAC, CONSISTING OF THE AXIAL PORTION OF THE MESOGASTRIUM, ARE VISIBLE, ALSO THE *SUPERIOR FOSSA AND THE *SPLENIC FOSSA OF THE OMENTAL SAC.

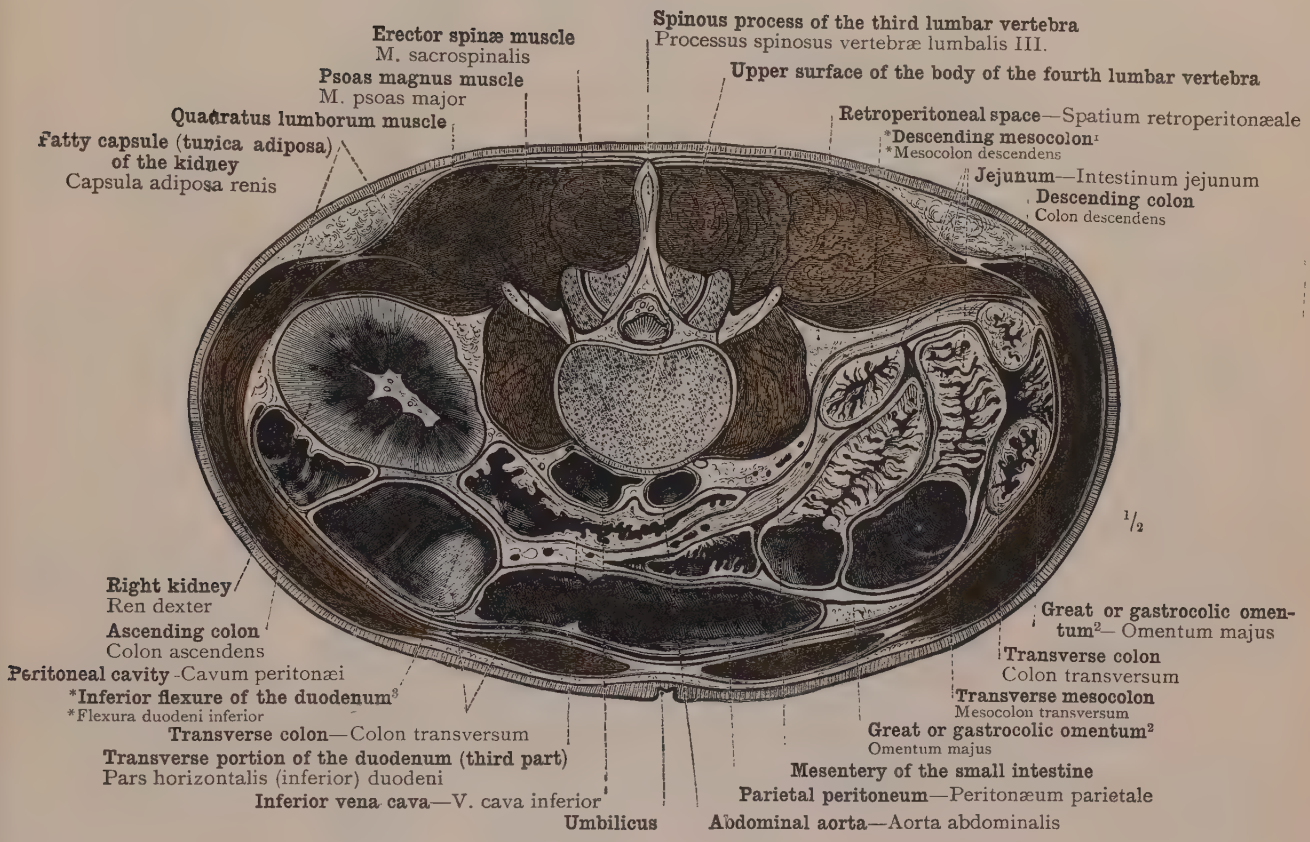
Topographical Anatomy of the Thoracic Organs and of the Viscera in the Upper Part of the Abdominal Cavity.



[1] See Appendix, note 37. [2] Called also *suprarenal body*, or *adrenal*. [3] See Appendix, note 36. [4] See Appendix, note 42.
[5] The *gastrosplenic omentum* is connected below with the *great omentum*, and is often regarded as a part of it.—Tr.
[6] See Appendix, note 42.

FIG. 810.—HORIZONTAL SECTION THROUGH THE TRUNK PASSING BETWEEN THE BODIES OF THE TWELFTH DORSAL AND FIRST LUMBAR VERTEBRÆ.

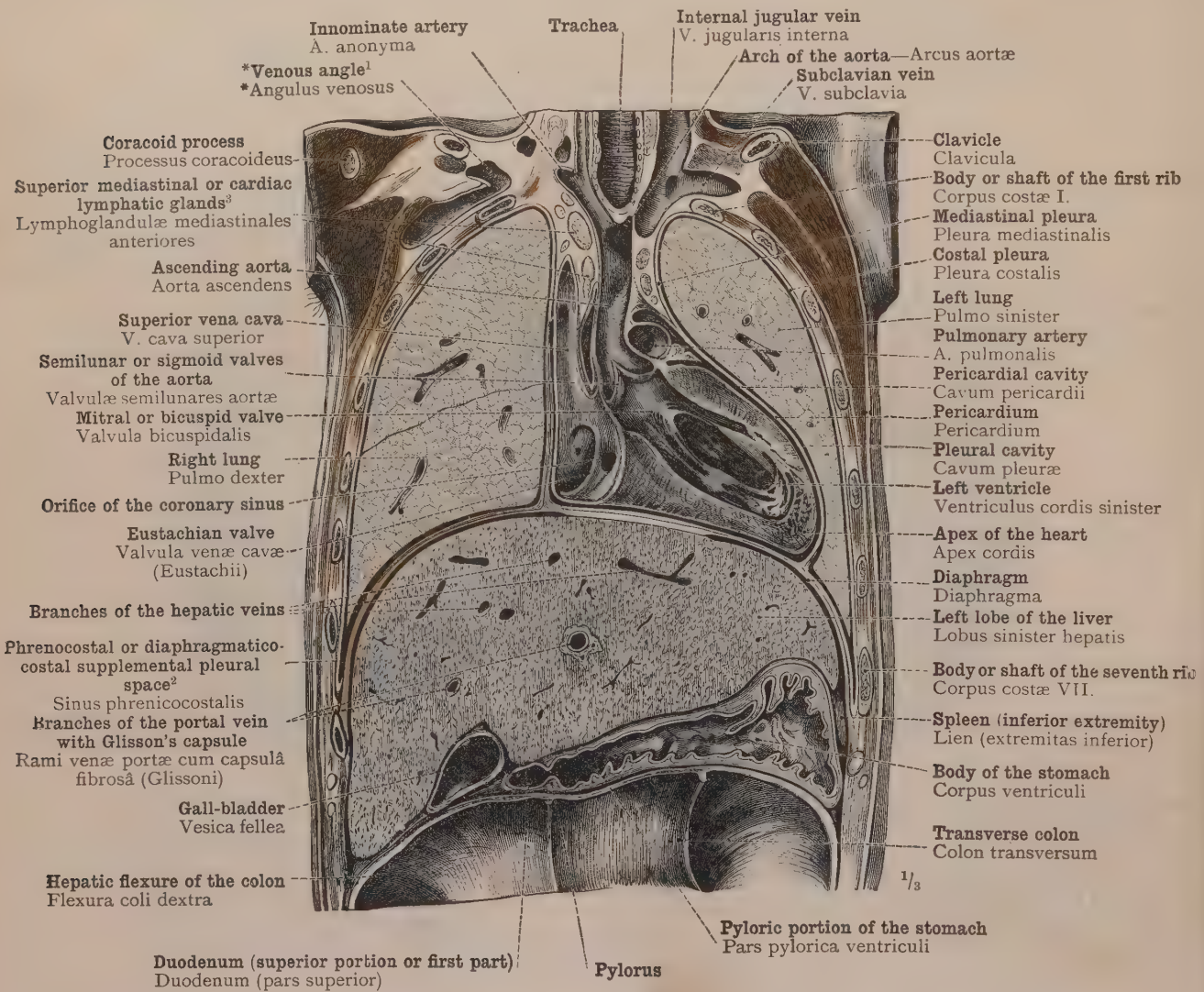
The section cuts the liver almost through its greatest transverse (horizontal) dimension, the stomach above the middle of its body, the spleen about the middle of its vertical extent, the body and tail of the pancreas near the upper border of that organ, the right kidney near its upper extremity, the left kidney above its middle; both suprarenal capsules also appear in the section. Between the vena cava inferior and the *hepatoduodenal ligament (*see Appendix, note* 42), the section passes through the foramen of Winslow (foramen epiploicum Winslowi), into which the caudate lobe of the liver (*processus caudatus hepatis—see Appendix, note* 16) projects; behind the small or gastrohepatic omentum (*see Appendix, note* 42) the *vestibule of the omental sac (*see Appendix, note* 44) is cut across. The aorta is divided as it passes through the aortic opening in the diaphragm, the vena cava inferior below its entrance into the fissure or fossa of the vena cava, and the portal vein just after it has passed between the layers of the small or gastrohepatic omentum.



[1] See note [1] to p. 453. [2] Or *epiploon*. See note [2] to p 456. [3] See Appendix, note 6.

FIG. 811.—HORIZONTAL SECTION THROUGH THE TRUNK AT THE LEVEL OF THE UMBILICUS, PASSING BETWEEN THE BODIES OF THE THIRD AND FOURTH LUMBAR VERTEBRÆ.

The right kidney is divided near its inferior extremity, but the left kidney is entirely above the plane of section. As regards the small intestine, the whole length of the transverse portion of the duodenum appears in the section, in addition to several coils of the jejunum. The ascending colon is divided close to the commencement of the hepatic flexure. The greater part of the transverse colon is distended, and is divided nearly in the direction of its long axis; in the neighbourhood of the splenic flexure, however, it is contracted, and is divided transversely; the descending colon is also seen in transverse section. The section further shows portions of the great or gastrocolic omentum, of the mesentery of the small intestine, and of the *descending mesocolon (*see note* [1] *above*).



[1] *Angulus venosus*, the **venous angle*, is the name given by the author to the junction of the internal jugular and subclavian veins to form the innominate vein. The term is not used by English anatomists.—TR.

[2] See Appendix, note 36.

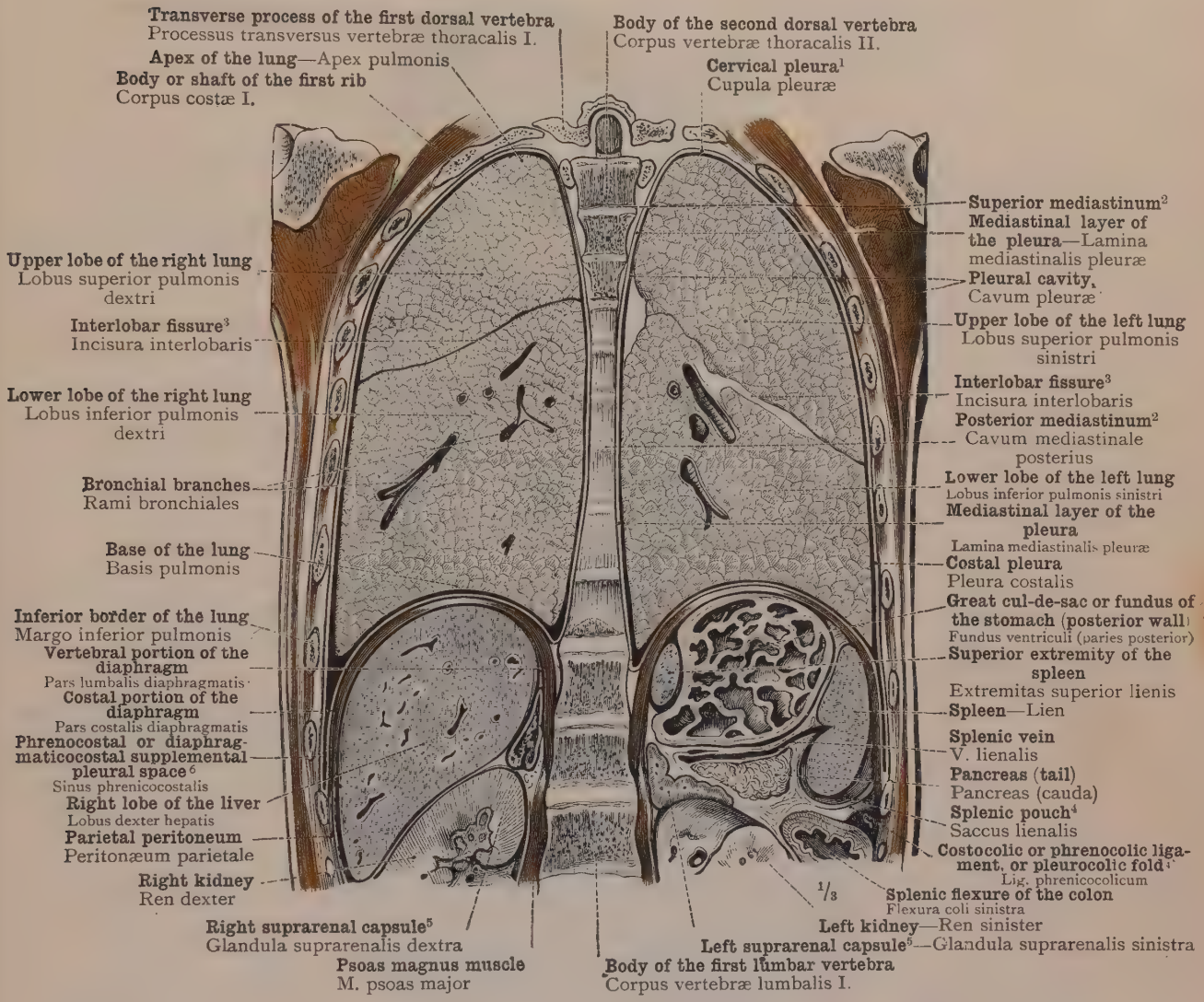
[3] There are three or four lymphatic glands behind the lower part of the body of the sternum, between that bone and the pericardium, known as the *anterior mediastinal lymphatic glands*. Those figured here are, however, in the *superior mediastinum* of English anatomists, and are, therefore, *superior mediastinal lymphatic glands* (see note [1] to p. 456). As they receive the lymphatics of the heart in addition to those of the greater part of the pericardium and of the thymus gland, they are often called the *cardiac lymphat c glands*.—TR.

FIG. 812.—CORONAL SECTION THROUGH THE TRUNK: ON THE RIGHT SIDE OF THE BODY THE SECTION PASSES THROUGH THE ANTERIOR AXILLARY FOLD, ON THE LEFT SIDE A LITTLE IN FRONT OF THIS FOLD.

The left ventricle, the ascending aorta, and the superior vena cava are divided longitudinally, while the pulmonary artery is divided transversely. The right auricle is divided in front of the orifices of the inferior vena cava and the coronary sinus. The liver is cut across almost in its greatest transverse (vertical) dimension. The situation of the contracted stomach and of the superior or first part of the duodenum in relation to the liver and to the greatly distended transverse colon is to be noted.

[The superior and middle mediastina of English anatomists are seen in coronal section: the plane between them is at the level of the reflection of the pericardium on the ascending aorta, above the transversely divided pulmonary artery. *See note [2] to p. 410 and Appendix, note [24]*.—TR.]

Topographical Anatomy of the Thoracic Organs and of the Viscera in the Upper Part of the Abdominal Cavity.

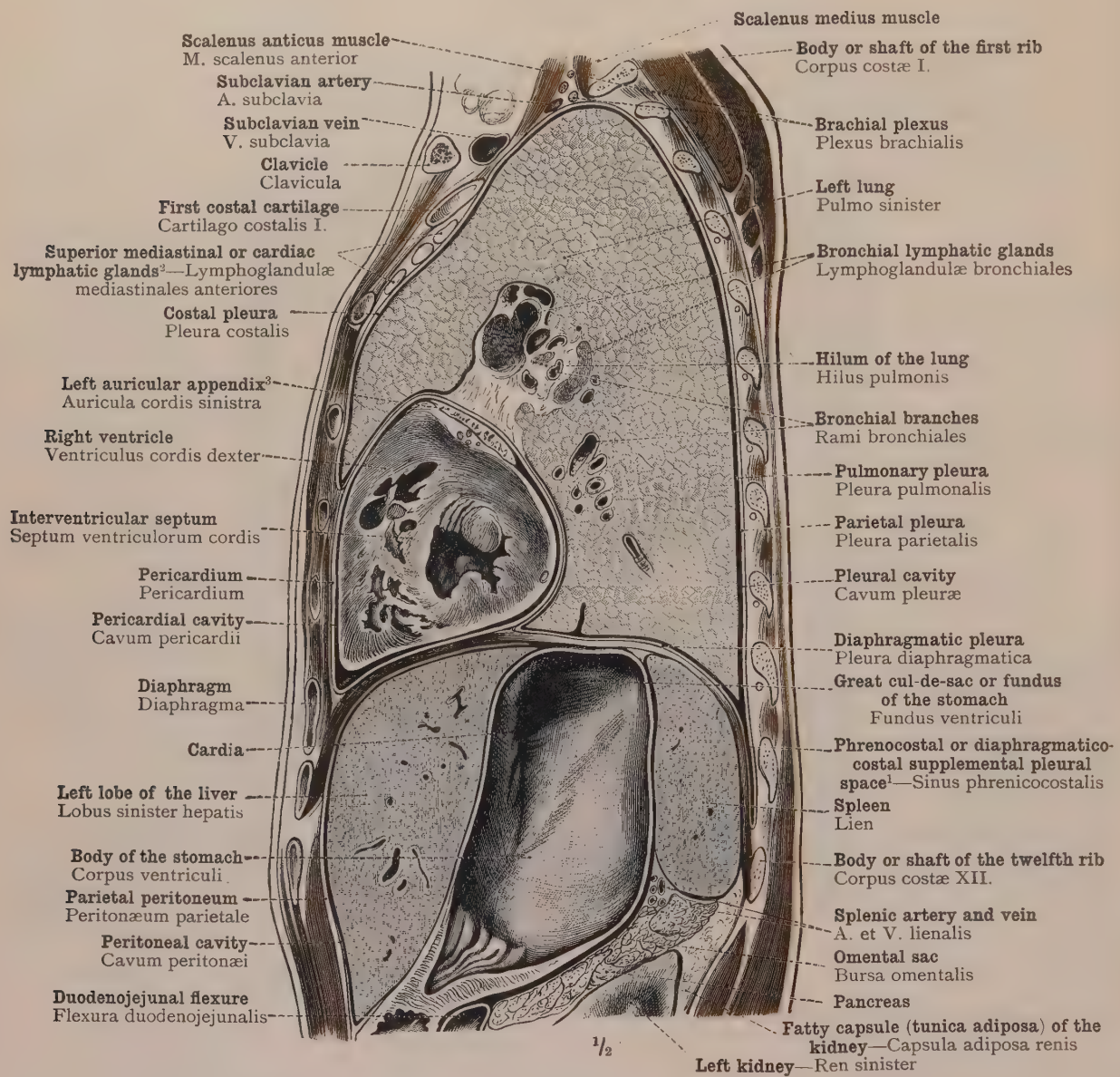


1 See note 1 to p. 467. 2 See note 2 to p. 410 and Appendix, note 24. 3 See note 1 to p. 464.
4 See Appendix, note 41. 5 Called also *suprarenal body*, or *adrenal*. 6 See Appendix, note 36.

FIG. 813.—CORONAL SECTION THROUGH THE TRUNK, A LITTLE BEHIND THE AXILLARY LINE (*see Fig.* 818, *p.* 488).

The section passes *through* the bodies of the uppermost and lowermost dorsal vertebræ, but passes *in front of* the bodies of the fifth to the tenth dorsal vertebræ; hence those portions of the viscera that lie in the posterior portions of the thoracic and abdominal cavities on either side of the spinal column appear in the section. The lungs are divided very nearly in their greatest vertical dimension. In the right side of the abdominal cavity, the relations of the kidney and the suprarenal capsule (*see note 5 above*) to the liver are shown; in the left side, the relations of the spleen to the great cul-de-sac or fundus of the stomach, to the tail of the pancreas, and to the splenic flexure of the colon.

Topographical Anatomy of the Thoracic Organs and of the Viscera in the Upper Part of the Abdominal Cavity.



[1] See Appendix, note 36.

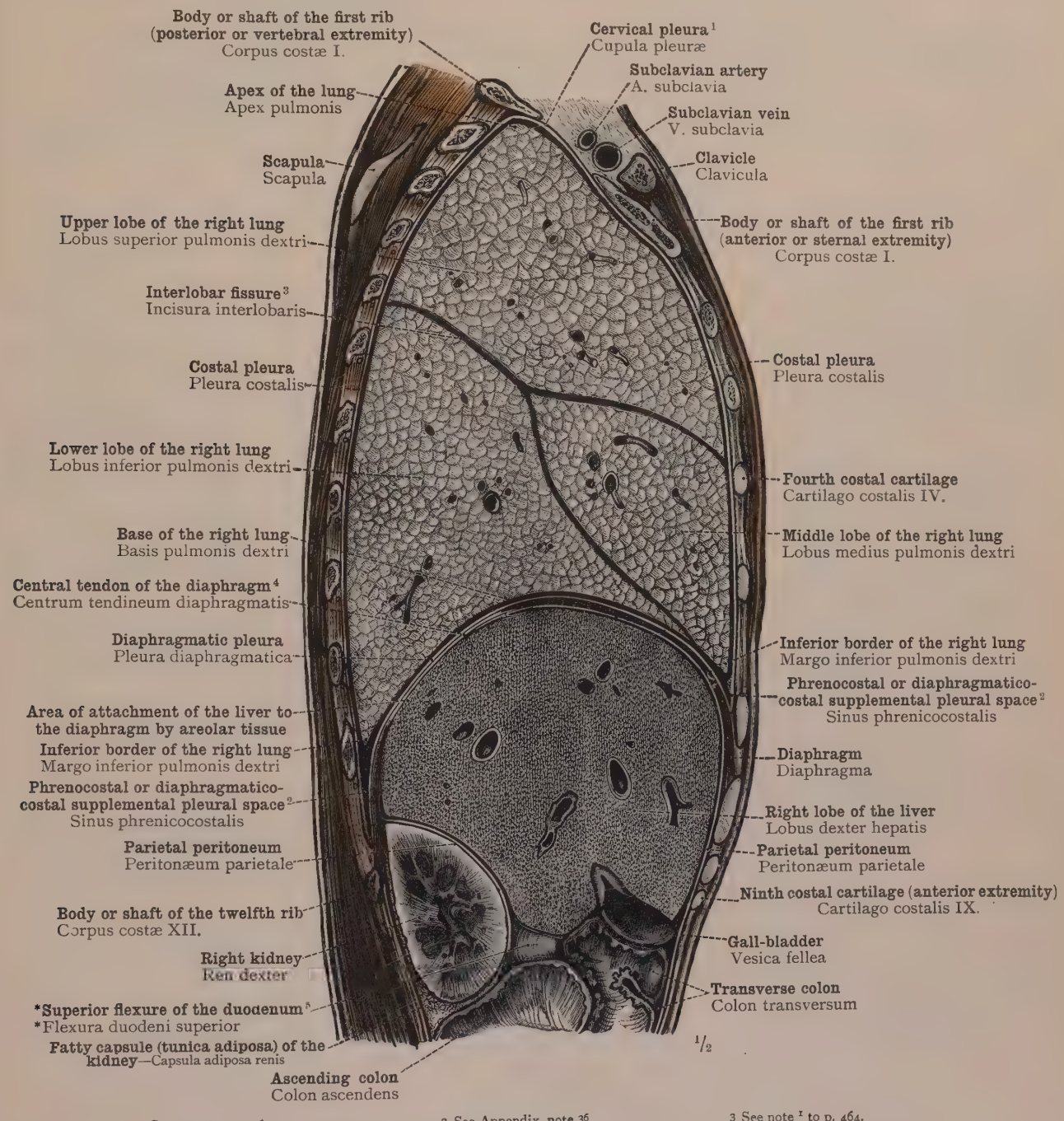
[2] See note 3 to p. 482.

[3] See note 3 to p. 411.

FIG. 814.—SAGITTAL SECTION THROUGH THE TRUNK, 4 CENTIMETRES (1·575 INCHES) TO THE LEFT OF THE MEDIAN PLANE.

The section passes through the hilum of the left lung, and divides the lung itself very nearly in its greatest vertical dimension ; the two ventricles are divided obliquely. The body and the great cul-de-sac or fundus of the moderately distended stomach are divided approximately in their long axis, so that the position of the cardia at the upper end of the small curvature of the stomach is well shown. The relations of the stomach to the left lobe of the liver, to the spleen, to the pancreas, and to the duodenojejunal flexure, are to be noted.

Topographical Anatomy of the Thoracic Organs and of the Viscera in the Upper Part of the Abdominal Cavity.

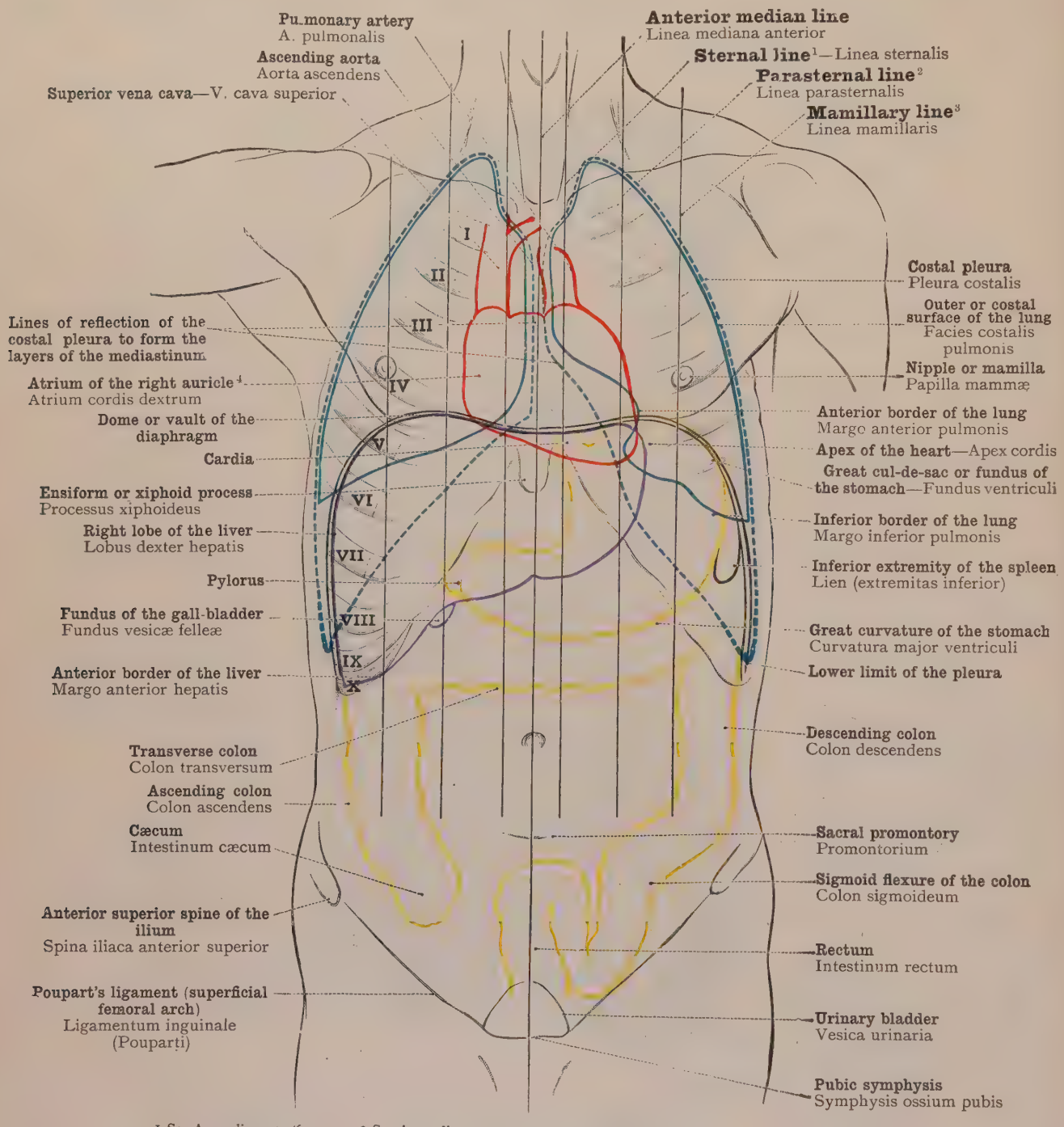

Body or shaft of the first rib (posterior or vertebral extremity) Corpus costæ I.
Cervical pleura[1] Cupula pleuræ
Subclavian artery A. subclavia
Apex of the lung Apex pulmonis
Subclavian vein V. subclavia
Scapula Scapula
Clavicle Clavicula
Upper lobe of the right lung Lobus superior pulmonis dextri
Body or shaft of the first rib (anterior or sternal extremity) Corpus costæ I.
Interlobar fissure[3] Incisura interlobaris
Costal pleura Pleura costalis
Costal pleura Pleura costalis
Lower lobe of the right lung Lobus inferior pulmonis dextri
Fourth costal cartilage Cartilago costalis IV.
Base of the right lung Basis pulmonis dextri
Middle lobe of the right lung Lobus medius pulmonis dextri
Central tendon of the diaphragm[4] Centrum tendineum diaphragmatis
Diaphragmatic pleura Pleura diaphragmatica
Inferior border of the right lung Margo inferior pulmonis dextri
Phrenocostal or diaphragmatico-costal supplemental pleural space[2] Sinus phrenicocostalis
Area of attachment of the liver to the diaphragm by areolar tissue
Inferior border of the right lung Margo inferior pulmonis dextri
Diaphragm Diaphragma
Phrenocostal or diaphragmatico-costal supplemental pleural space[2] Sinus phrenicocostalis
Right lobe of the liver Lobus dexter hepatis
Parietal peritoneum Peritonæum parietale
Parietal peritoneum Peritonæum parietale
Ninth costal cartilage (anterior extremity) Cartilago costalis IX.
Body or shaft of the twelfth rib Corpus costæ XII.
Gall-bladder Vesica fellea
Right kidney Ren dexter
Transverse colon Colon transversum
*Superior flexure of the duodenum[5] *Flexura duodeni superior
Fatty capsule (tunica adiposa) of the kidney—Capsula adiposa renis
Ascending colon Colon ascendens
1/2

[1] See note [1] to p. 467. [2] See Appendix, note 36. [3] See note [1] to p. 464.
[4] Called also the *trefoil* or *cordiform tendon* of the diaphragm. [5] See Appendix note 6.

FIG. 815.—SAGITTAL SECTION THROUGH THE TRUNK, 6 CENTIMETRES (2·362 INCHES) TO THE RIGHT OF THE MEDIAN PLANE.

The section passes to the right of the hilum of the lung, and divides all three lobes of the organ. The other organs seen in the section are: The right lobe of the liver, the gall-bladder, the right kidney, and portions of the ascending and transverse colon, which latter is moderately distended. The *superior flexure of the duodenum is also shown, its right (convex) wall appearing in the section.

Topographical Anatomy of the Right Lung and of the Viscera in the Upper Part of the Abdominal Cavity.



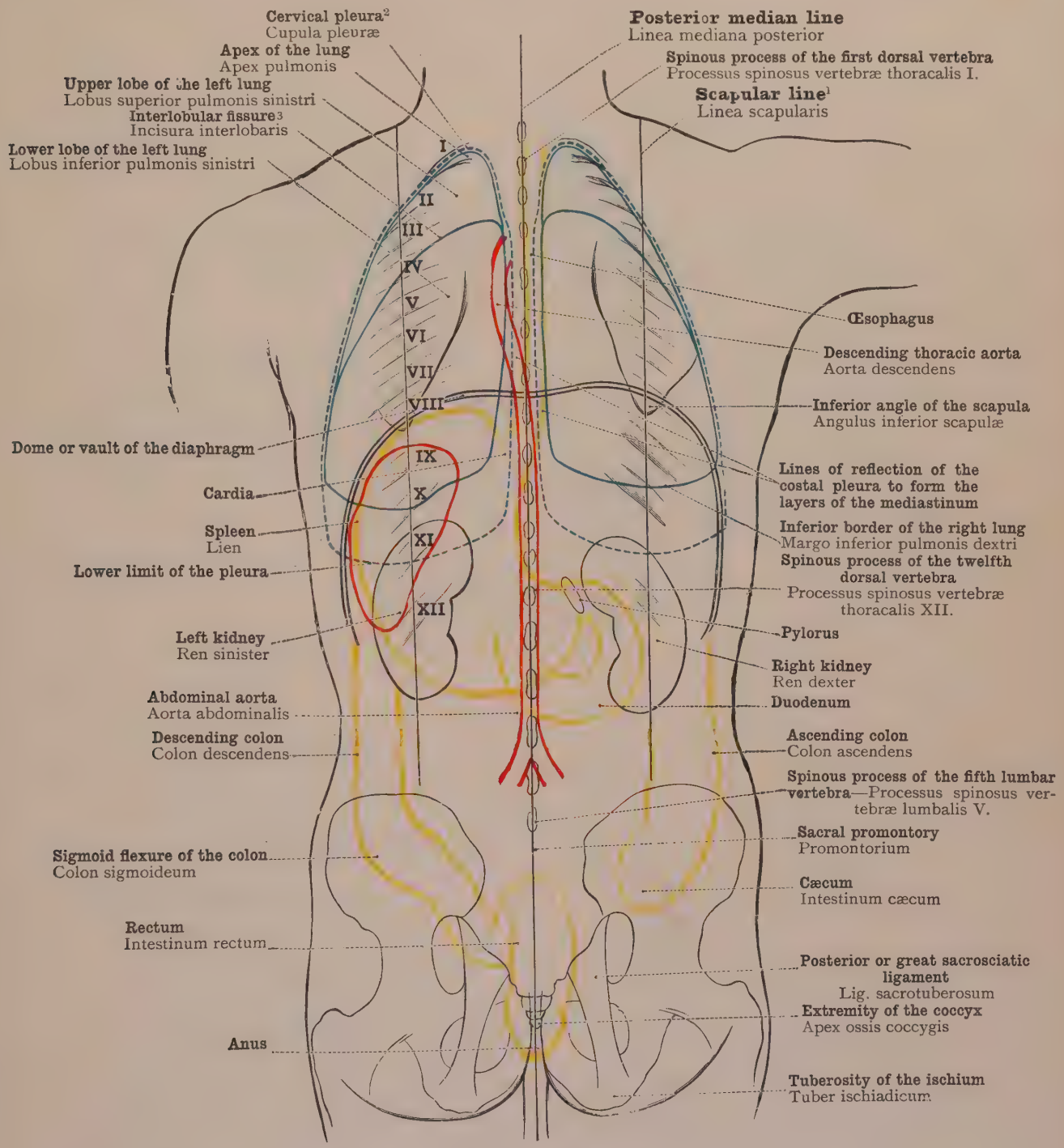
[1] See Appendix, note 46. [2] See Appendix, note 47. [3] See Appendix, note 48. [4] See note 3 to p. 411.

FIG. 816.—PROJECTION-OUTLINES OF THE THORACIC AND ABDOMINAL ORGANS ON THE ANTERIOR SURFACE OF THE TRUNK.

The red line indicates the outline of the heart and the great vessels (superior vena cava, ascending aorta, and pulmonary artery); the continuous blue lines indicate the outlines of the two lungs; the dotted blue lines, the boundaries of the pleural cavities. The violet line indicates the projection-outline of the liver and the fundus of the gall-bladder; the yellow lines indicate the projection-outline of the stomach and the different sections of the large intestine. The projection-outlines of the dome or vault of the diaphragm and of the inferior extremity of the spleen are black.

GUIDE-LINES FOR THE DETERMINATION OF THE POSITION OF THE THORACIC ORGANS: ANTERIOR MEDIAN LINE, STERNAL LINE (*see Appendix, note* 46), PARASTERNAL LINE (*see Appendix, note* 47), AND MAMILLARY LINE (*see Appendix, note* 48). THE RIBS ARE DISTINGUISHED BY ROMAN NUMERALS.

Projection-Outlines of the Thoracic and Abdominal Viscera.



[2] The *scapular line* is a vertical line traced on the back of the trunk passing through the inferior angle of the scapula.—Tr.

[2] See note [1] to p. 467.

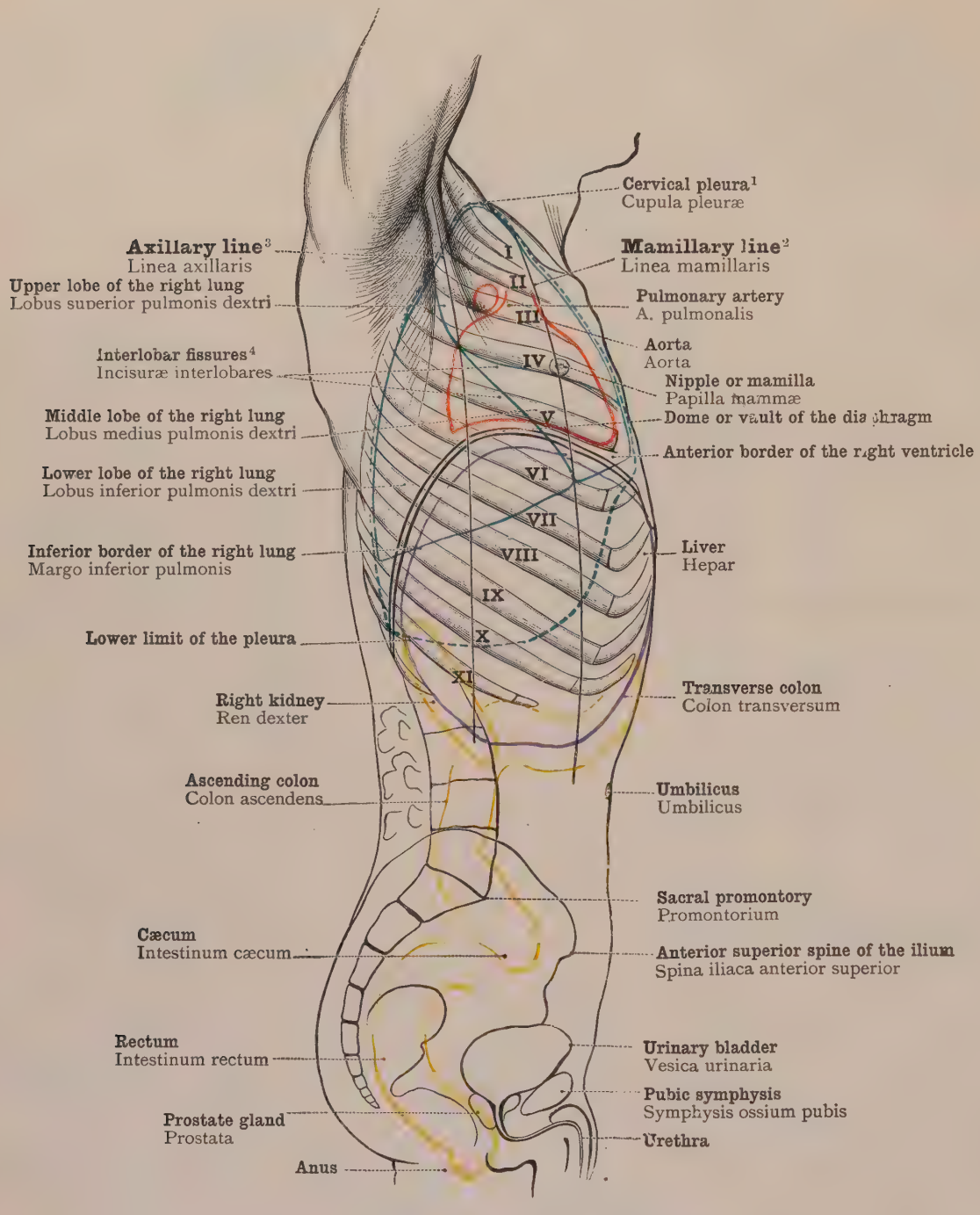
[3] See note [1] to p. 464.

FIG. 817.—PROJECTION-OUTLINES OF THE THORACIC AND ABDOMINAL ORGANS ON THE POSTERIOR SURFACE OF THE TRUNK.

The red lines indicate the outlines of the descending thoracic aorta, the abdominal aorta, and the spleen; the continuous blue lines indicate the outlines of the two lungs and of their upper and lower lobes; the dotted blue lines, the boundaries of the pleural cavities. The yellow lines indicate the projection-outlines of the stomach, the duodenum, and various portions of the large intestine. The projection-outlines of the dome or vault of the diaphragm and of the two kidneys are black.

GUIDE-LINES FOR THE DETERMINATION OF THE POSITION OF THE THORACIC ORGANS: POSTERIOR MEDIAN LINE AND SCAPULAR LINE (*see note* [1] *above*). THE RIBS ARE DISTINGUISHED BY ROMAN NUMERALS.

Projection-Outlines of the Thoracic and Abdominal Viscera.



[1] See note [1] to p. 467. [2] See Appendix, note [48]. [3] See Appendix, note [49]. [4] See note [1] to p. 464.

FIG. 818.—PROJECTION-OUTLINES OF THE THORACIC AND ABDOMINAL ORGANS ON THE RIGHT SIDE OF THE TRUNK.

The red line indicates the outline of the heart and the pulmonary artery; the continuous blue lines indicate the outlines of the right lung and its three lobes; the dotted blue line indicates the boundaries of the pleural cavity. The violet line indicates the projection-outline of the right lobe of the liver; the yellow lines indicate the projection-outlines of the right kidney and the different sections of the large intestine.

GUIDE-LINES FOR THE DETERMINATION OF THE POSITION OF THE THORACIC ORGANS: AXILLARY LINE (*see Appendix, note* [49]) AND MAMILLARY LINE (*see Appendix, note* [48]). THE RIBS ARE DISTINGUISHED BY ROMAN NUMERALS.

Projection-Outlines of the Thoracic and Abdominal Viscera.

APPARATUS UROGENITALIS

GENITO-URINARY APPARATUS

ORGANA UROPOËTICA

URINARY ORGANS

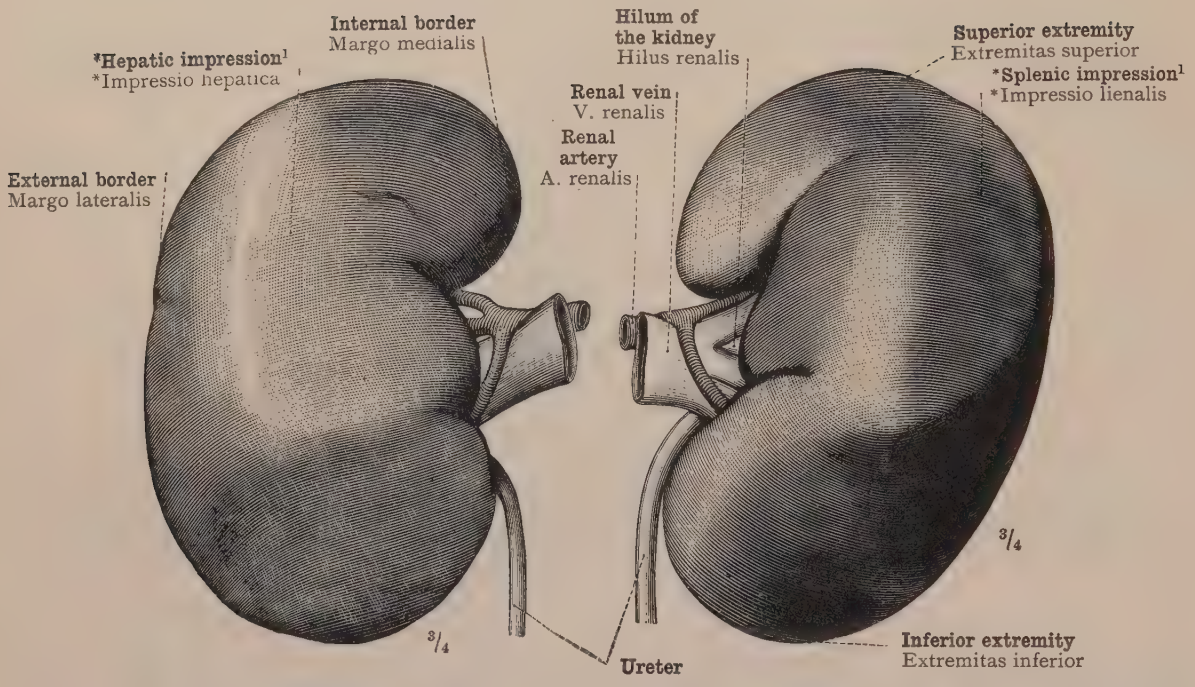


FIG. 819.—REN DEXTER, THE RIGHT KIDNEY. FACIES ANTERIOR, ANTERIOR SURFACE.

FIG. 820.—REN SINISTER, THE LEFT KIDNEY. FACIES ANTERIOR, ANTERIOR SURFACE.

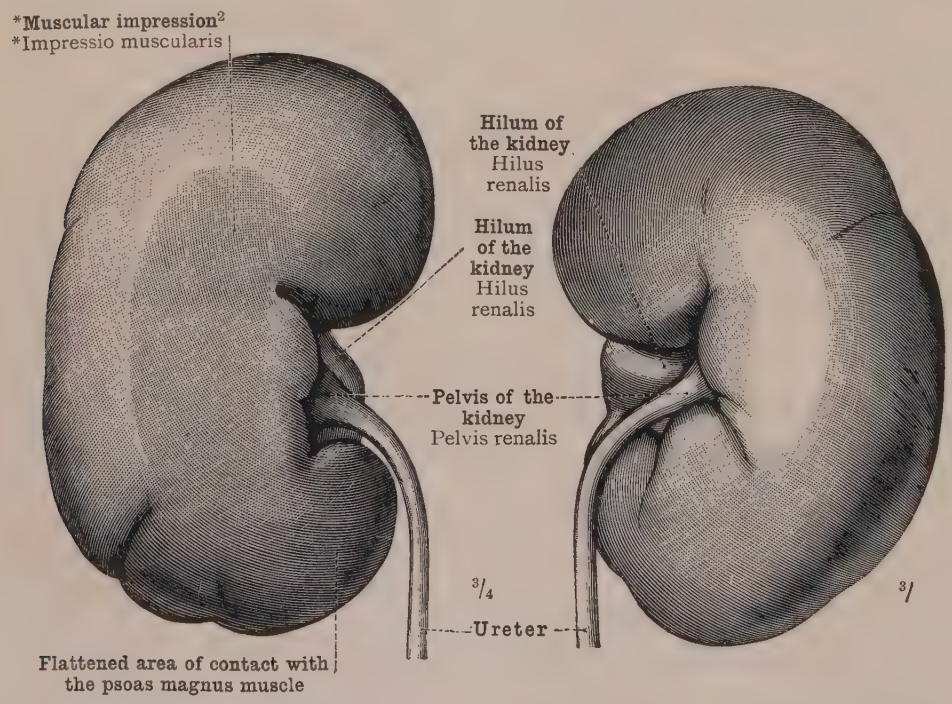


FIG. 821.—REN SINISTER, THE LEFT KIDNEY. FACIES POSTERIOR, POSTERIOR SURFACE.

FIG. 822.—REN DEXTER, THE RIGHT KIDNEY. FACIES POSTERIOR, POSTERIOR SURFACE.

[1] *Impressions.*—When the solid viscera are hardened *in situ*, their surface presents facets corresponding to the areas of contact with one another and with the structures forming the wall of the abdominal cavity. Such facets are termed *impressions.* The word is used most frequently in connexion with the *impressions* of the liver.—TR.

[2] The *muscular impression* is a flattening, very variable in extent, indicating the area of contact of the kidney with the anterior surface of the quadratus lumborum muscle (see also note [1]).—TR.

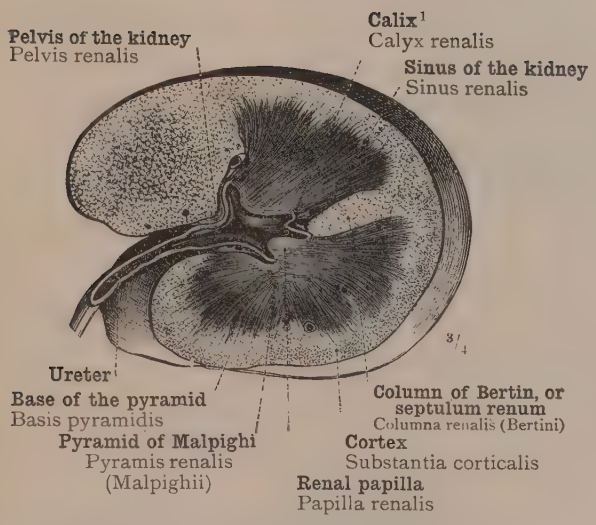


FIG. 823.—HORIZONTAL SECTION THROUGH THE MIDDLE OF THE RIGHT KIDNEY AND THE RENAL PELVIS.

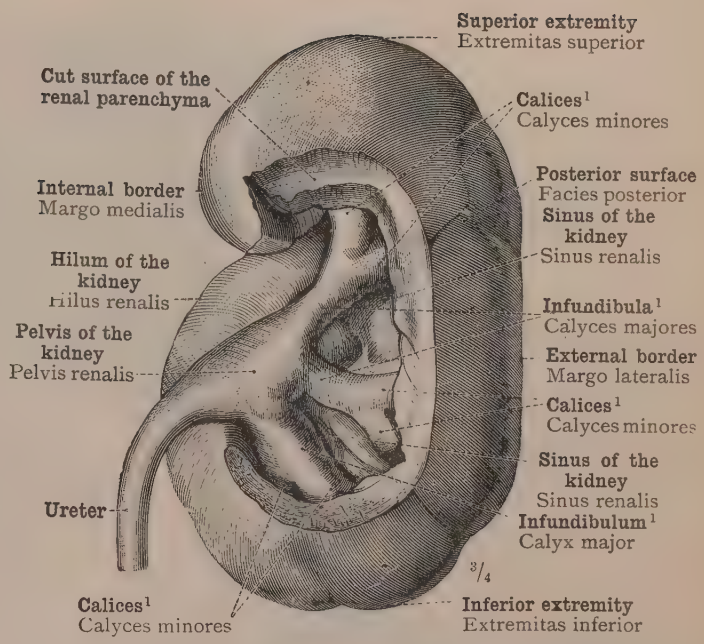


FIG. 824.—PELVIS RENALIS, THE PELVIS OF THE KIDNEY WITH THE CALICES AND INFUNDIBULA (CALYCES RENALES MINORES ET MAJORES) LAID BARE BY THE REMOVAL OF A PORTION OF THE RENAL PARENCHYMA FROM BEHIND.

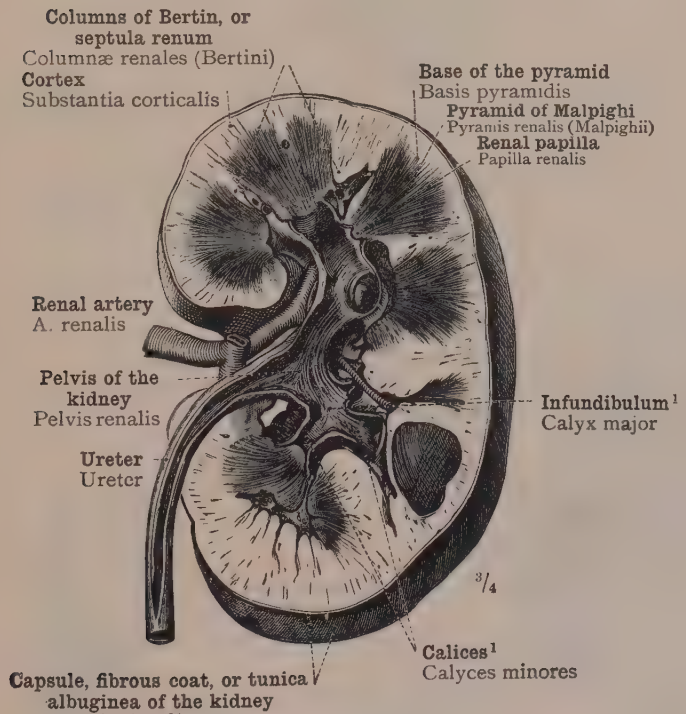


FIG. 825.—CORONAL SECTION THROUGH THE RIGHT KIDNEY AND THE RENAL PELVIS. SUBSTANTIA CORTICALIS, THE CORTEX; SUBSTANTIA MEDULLARIS, THE MEDULLA.

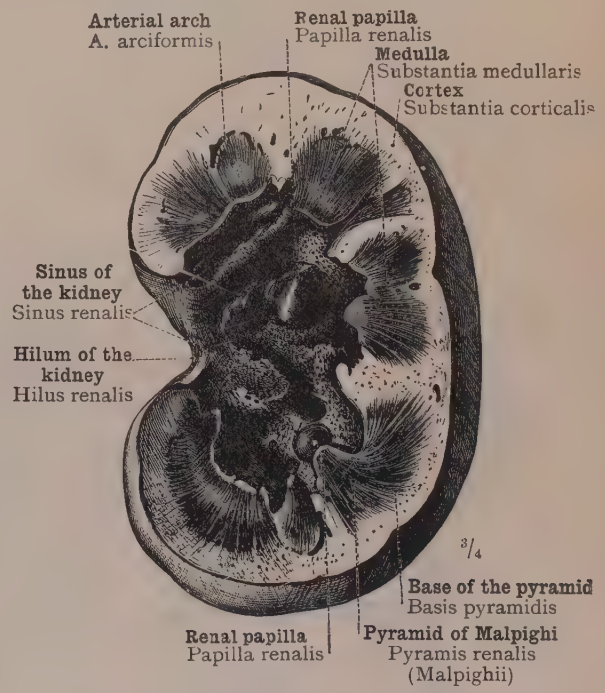


FIG. 826.—SINUS RENALIS, THE SINUS OF THE KIDNEY, DISPLAYED IN A CORONALLY-BISECTED KIDNEY BY REMOVAL OF THE RENAL PELVIS AND THE BLOODVESSELS. POSTERIOR HALF.

[1] See Appendix, note 50.

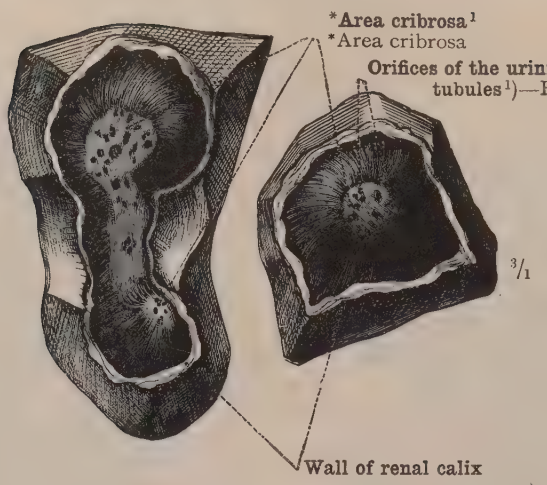


FIG. 827.—*AREA CRIBROSA[1] OF THE RENAL PAPILLA.

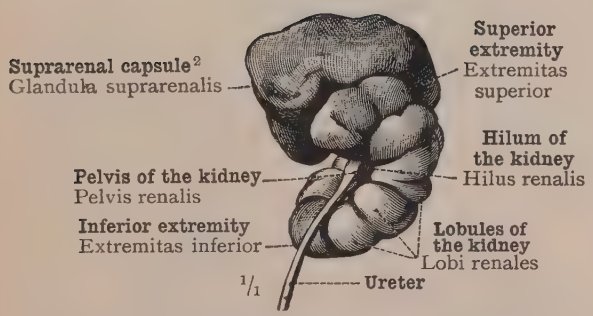


FIG. 828.—RIGHT KIDNEY AND SUPRARENAL CAPSULE[2] FROM A HUMAN FŒTUS IN THE MIDDLE OF THE SEVENTH MONTH (MONTHS OF FOUR WEEKS EACH). SEEN FROM BEHIND.

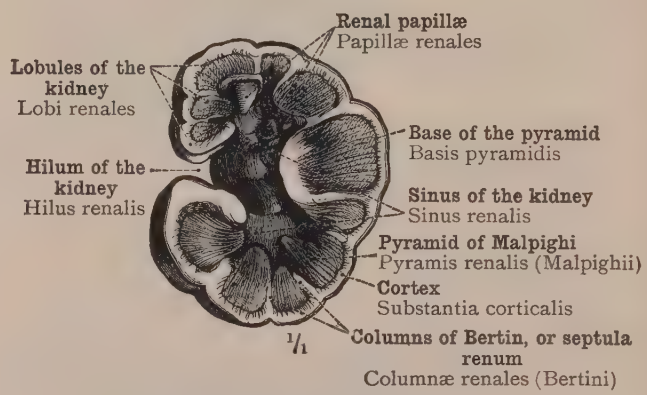


FIG. 829.—SINUS OF THE KIDNEY, DISPLAYED IN THE CORONALLY-BISECTED KIDNEY OF AN INFANT AGED THREE WEEKS

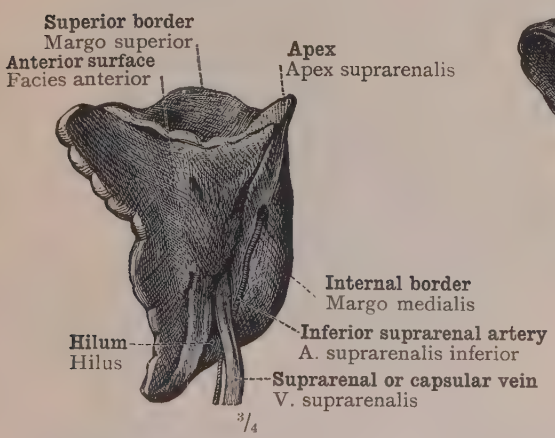


FIG. 830.—RIGHT SUPRARENAL CAPSULE,[2] SEEN FROM BEFORE.

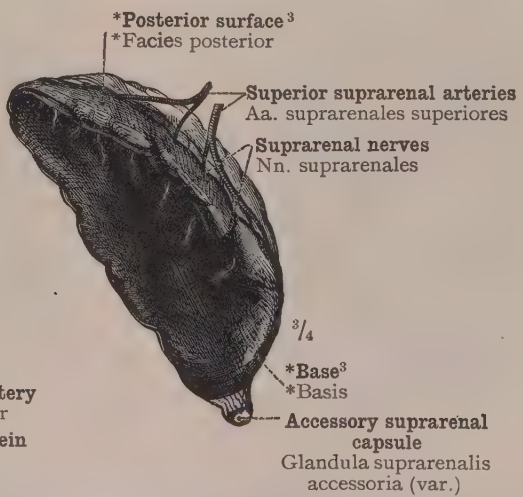


FIG. 831.—LEFT SUPRARENAL CAPSULE,[2] SEEN FROM BEHIND.

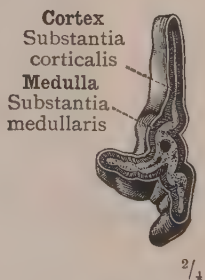


FIG. 832.—HORIZONTAL SECTION THROUGH THE LEFT SUPRARENAL CAPSULE.[2]

1 See Appendix, note 51. 2 Called also *suprarenal body*, or *adrenal*. 3 See Appendix, note 52.

Ren—The kidney.—Glandula suprarenalis—The suprarenal capsule (*see note 2 above*).

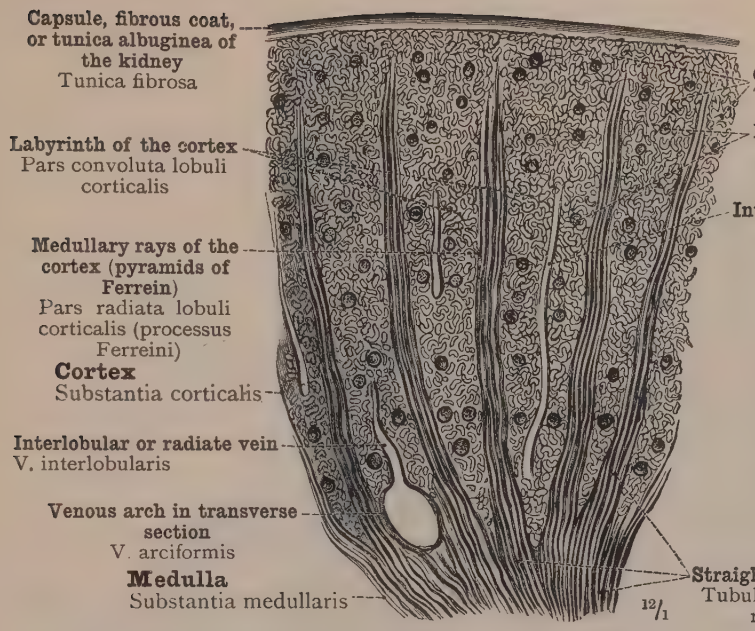


FIG. 833.—PART OF A SECTION THROUGH THE CORTEX OF THE KIDNEY IN THE DIRECTION OF THE STRAIGHT TUBULES.

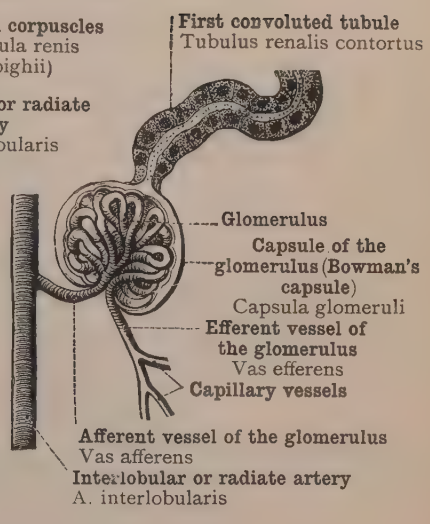
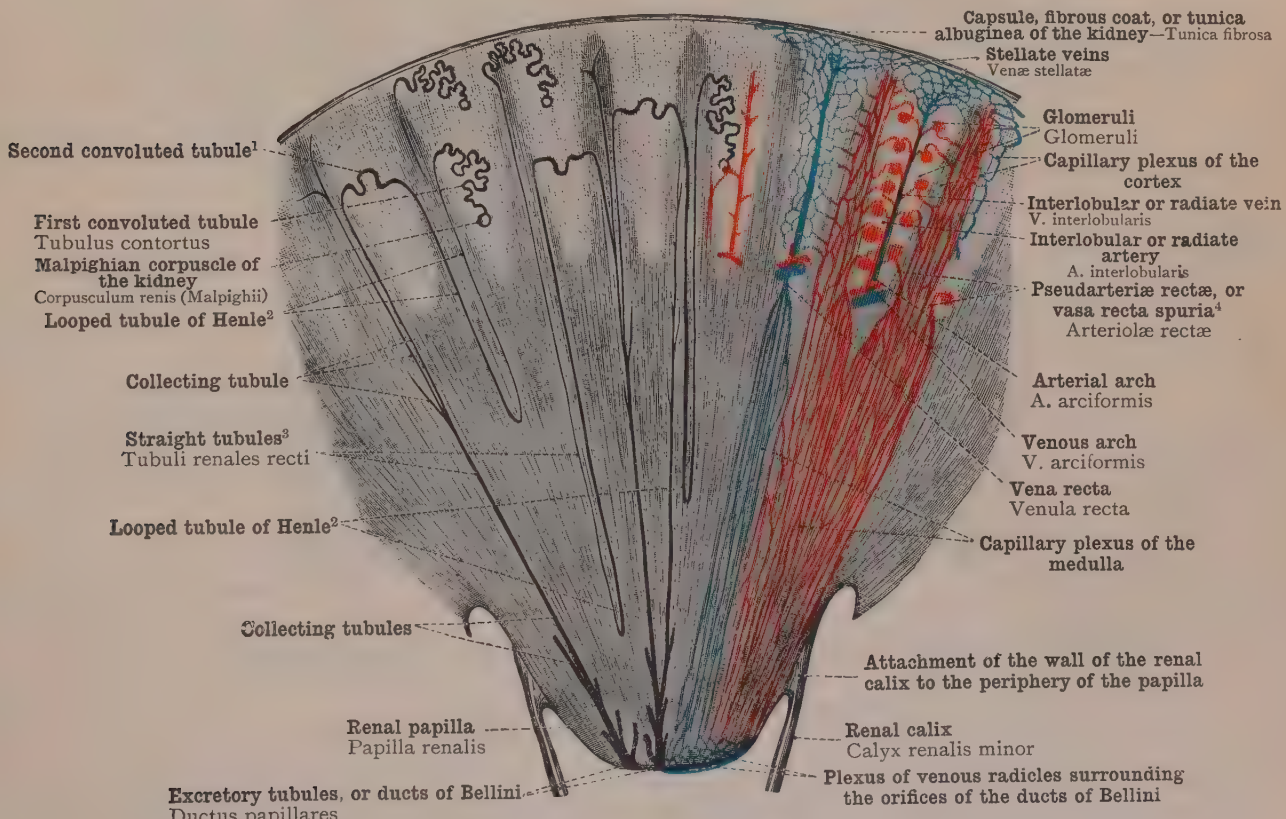


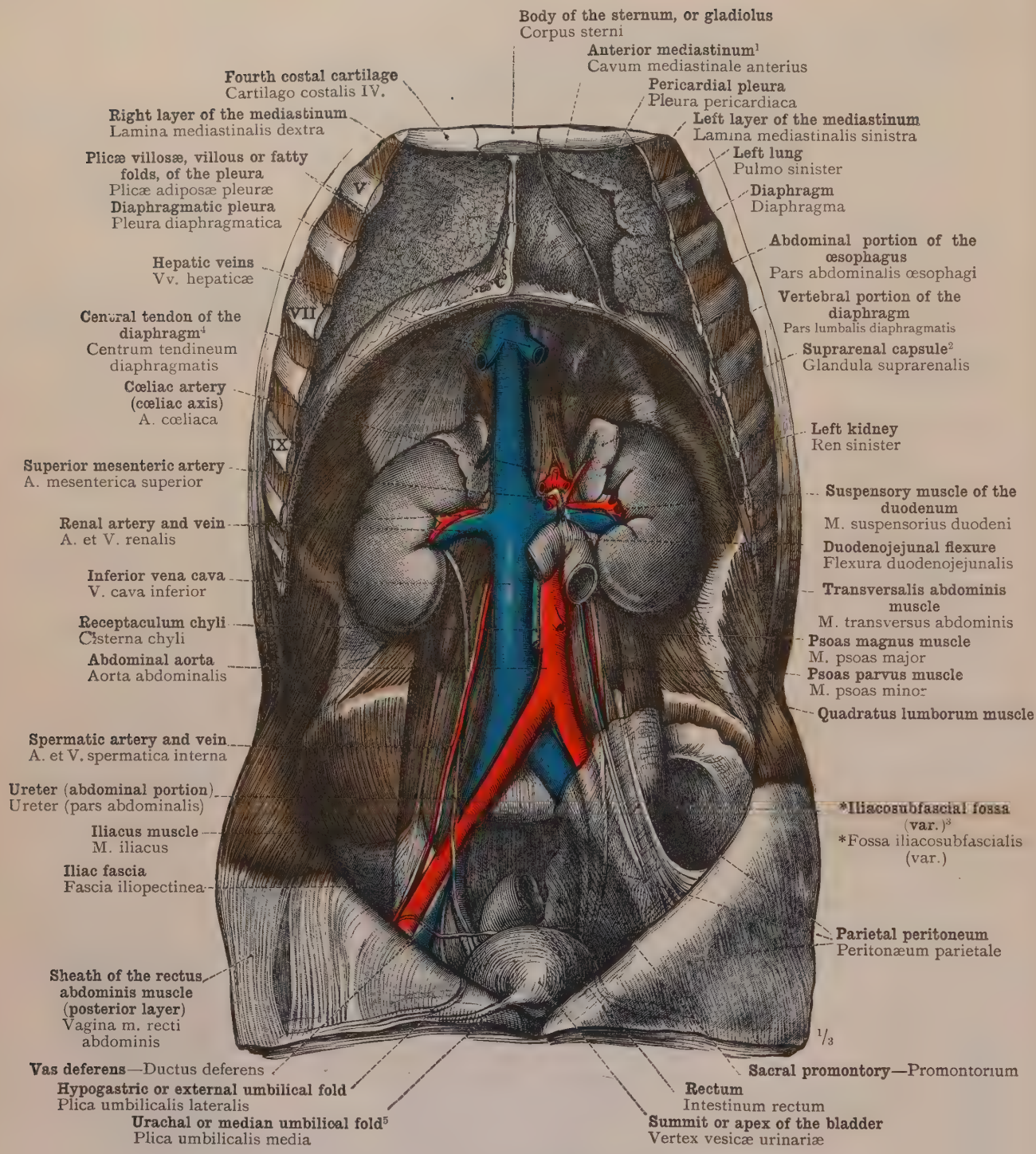
FIG. 834.—CORPUSCULUM RENIS (MALPIGHII), MALPIGHIAN CORPUSCLE OF THE KIDNEY. DIAGRAMMATIC.



[1] See Appendix, note 53. [2] See Appendix, note 54. [3] See Appendix, note 55. [4] See Appendix, note 56.

FIG. 835.—DIAGRAMMATIC REPRESENTATION OF THE ARRANGEMENT OF THE URINIFEROUS TUBULES AND THE BLOODVESSELS IN THE KIDNEY.

Ren—The kidney.

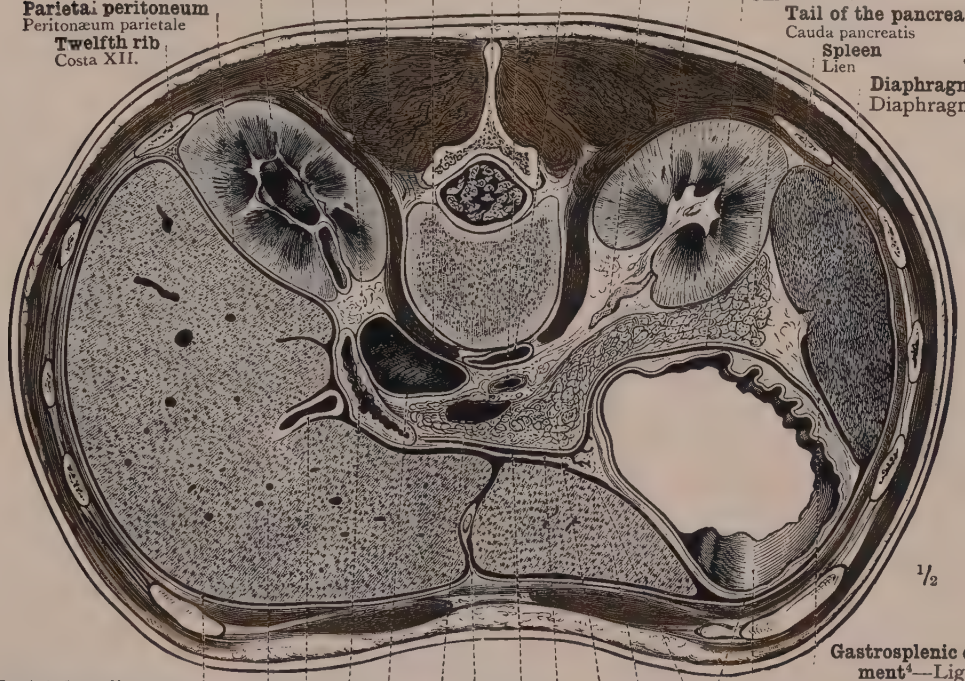


[1] See note [2] to p. 410 and Appendix, note 24.
[2] Called also *suprarenal body*, or *adrenal*.
[3] See Appendix, note 57.
[4] Called also the *trefoil* or *cordiform tendon* of the diaphragm.
[5] Also called the *superior false ligament*, or *suspensory ligament, of the bladder*.

FIG. 836.—POSTERIOR WALL OF THE ABDOMINAL CAVITY, AS SEEN AFTER THE REMOVAL OF THE PARIETAL PERITONEUM; SPATIUM RETROPERITONEALE, THE RETROPERITONEAL SPACE. POSITION OF THE KIDNEYS AND THE SUPRARENAL CAPSULES (*see note* [2] *above*). ABDOMINAL PORTION OF THE ŒSOPHAGUS. MUSCULUS SUSPENSORIUS DUODENI, THE SUSPENSORY MUSCLE OF THE DUODENUM.

In the left iliac fossa the parietal peritoneum has been left attached, in order to display the *iliacosubfascial fossa of the peritoneum, which exists in this specimen. (Compare with this figure Fig. 809, p. 479.)

Retroperitoneal Space and Topographical Anatomy of the Kidney.



[1] Also known as the *suprarenal body*, or *adrenal*. [2] See Appendix, note 42. [3] See Appendix, note 44.
[4] The *gastrosplenic omentum* is connected below with the *great omentum*, and is often regarded as a part of it.—Tr.

FIG. 837.—HORIZONTAL SECTION THROUGH THE TRUNK, PASSING THROUGH THE BODY OF THE FIRST LUMBAR VERTEBRA CLOSE TO ITS UPPER SURFACE. THE POSITION OF THE KIDNEYS IN RELATION TO THE ABDOMINAL WALL, THE LIVER, THE SPLEEN, AND THE PANCREAS.

The right kidney is divided above, the left below, the middle of its vertical extent. The stomach is divided below the middle of its body; the pancreas, near its inferior surface; the spleen, near its inferior extremity. In the hepatic region the section crosses the umbilical fissure (fossa venæ umbilicalis) and the body of the gall-bladder. Close to the latter the superior or first part of the duodenum is seen. (Compare this section with those shown in Figs. 810 and 811.)

Topographical Anatomy of the Kidney.

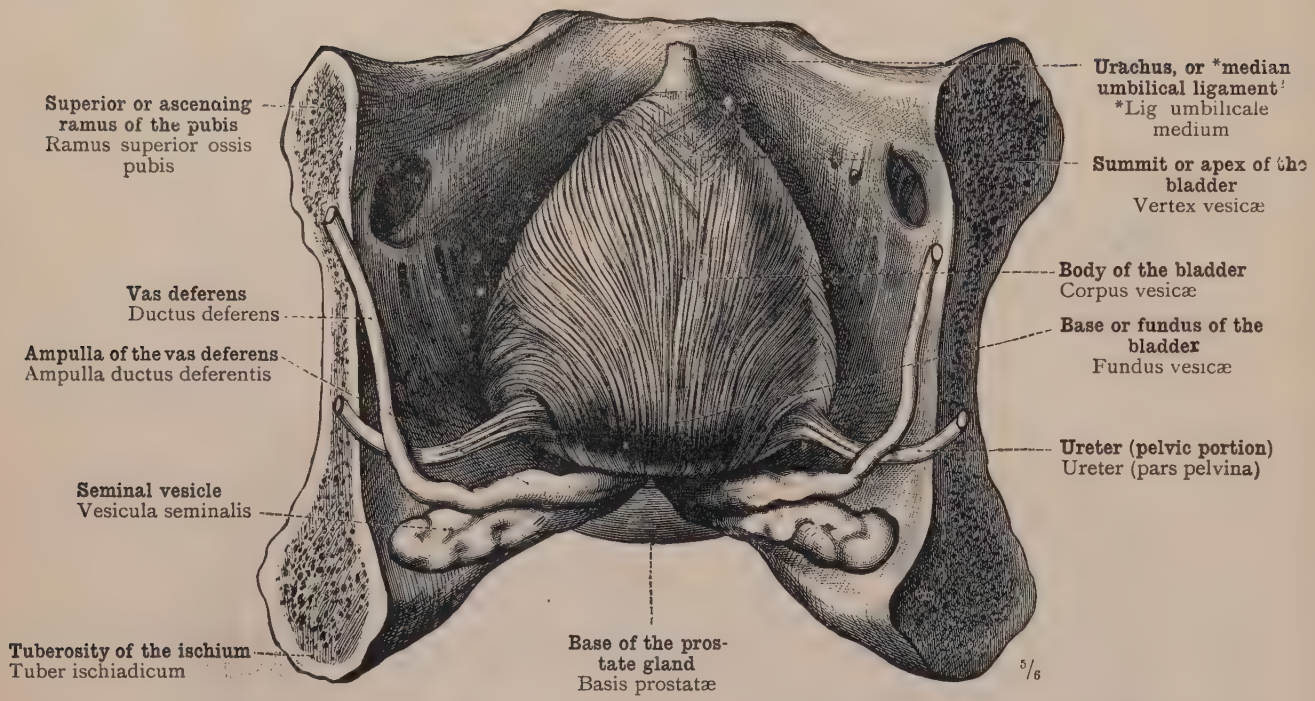


FIG. 838.—EXTERNAL LAYER OF THE MUSCULAR COAT OF THE BLADDER (STRATUM EXTERNUM TUNICÆ MUSCULARIS VESICÆ URINARIÆ). THE CONTRACTED MALE BLADDER IN ITS NATURAL POSITION, WITH THE PELVIC PORTION OF THE URETER, THE VAS DEFERENS, AND THE SEMINAL VESICLE SEEN FROM BEHIND.

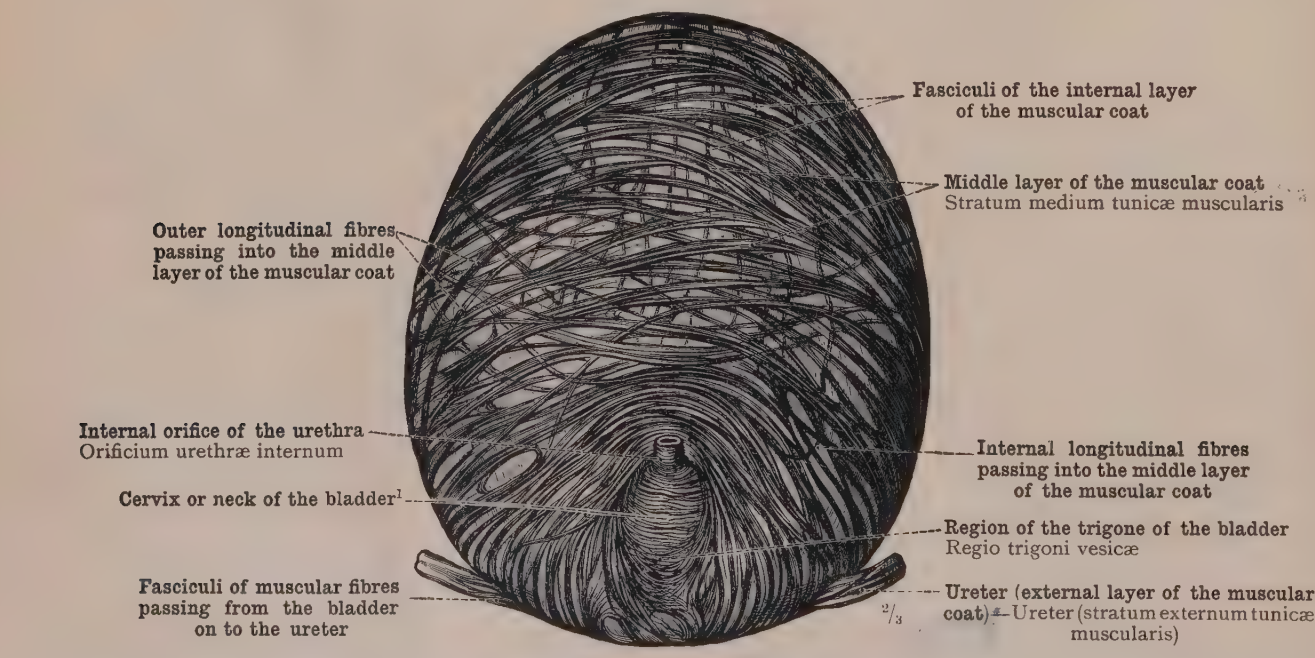

Fasciculi of the internal layer of the muscular coat
Middle layer of the muscular coat
Stratum medium tunicæ muscularis
Outer longitudinal fibres passing into the middle layer of the muscular coat
Internal orifice of the urethra
Orificium urethræ internum
Cervix or neck of the bladder[1]
Fasciculi of muscular fibres passing from the bladder on to the ureter
Internal longitudinal fibres passing into the middle layer of the muscular coat
Region of the trigone of the bladder
Regio trigoni vesicæ
Ureter (external layer of the muscular coat)
Ureter (stratum externum tunicæ muscularis)
2/3

FIG. 839.—MIDDLE AND INTERNAL LAYERS OF THE MUSCULAR COAT OF THE BLADDER (STRATUM MEDIUM ET STRATUM INTERNUM TUNICÆ MUSCULARIS VESICÆ URINARIÆ), SEEN FROM BEFORE AND BELOW IN THE MODERATELY-DISTENDED BLADDER.

[1] See Appendix, note [58].

[2] See note 3 to p. 387 in Part III.

Vesica urinaria—Urinary bladder.

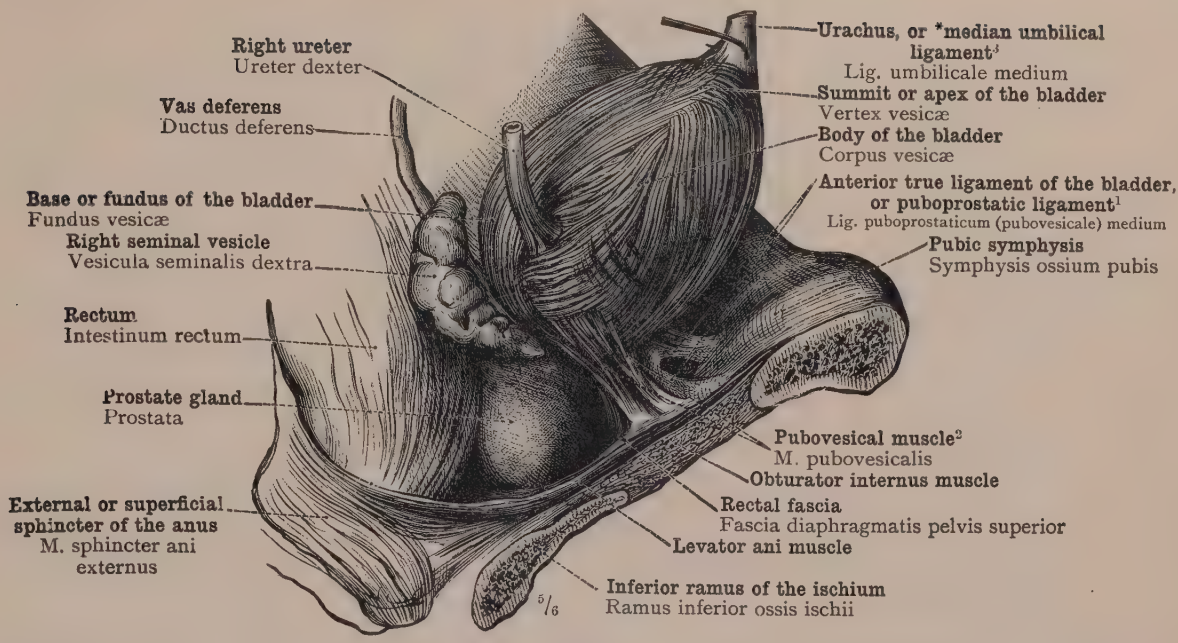


FIG. 840.—EXTERNAL LAYER OF THE MUSCULAR COAT (STRATUM EXTERNUM TUNICÆ MUSCULARIS) OF THE CONTRACTED BLADDER. RELATIONS OF THE SEMINAL VESICLE AND THE PROSTATE GLAND TO THE BLADDER AND THE RECTUM. SEEN FROM THE RIGHT SIDE.

The prostate gland is hypertrophied.

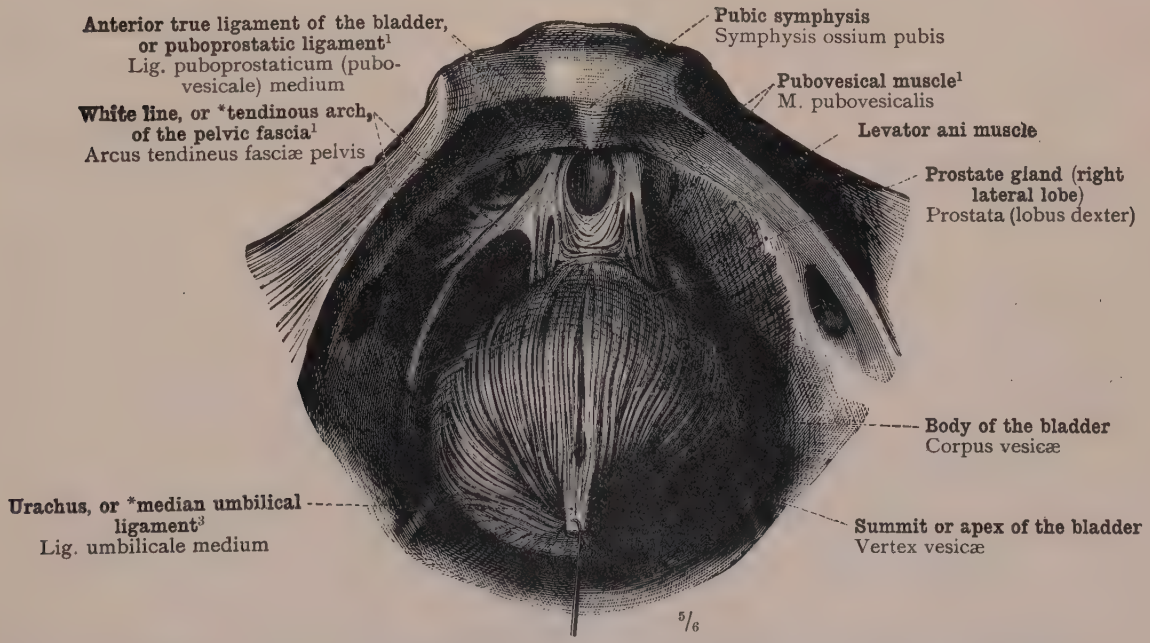


FIG. 841.—EXTERNAL LAYER OF THE MUSCULAR COAT (STRATUM EXTERNUM TUNICÆ MUSCULARIS) OF THE CONTRACTED BLADDER, SEEN FROM BEFORE AND ABOVE.

The bladder has been drawn as far as possible backwards away from the pubes. On the right side the levator ani muscle is exposed; on the left side the rectal fascia[1] covering upper or pelvic surface has been left intact.

[1] See Appendix, note 59. [2] See Appendix, note 60. [3] See note 3 to p. 387 in Part III.

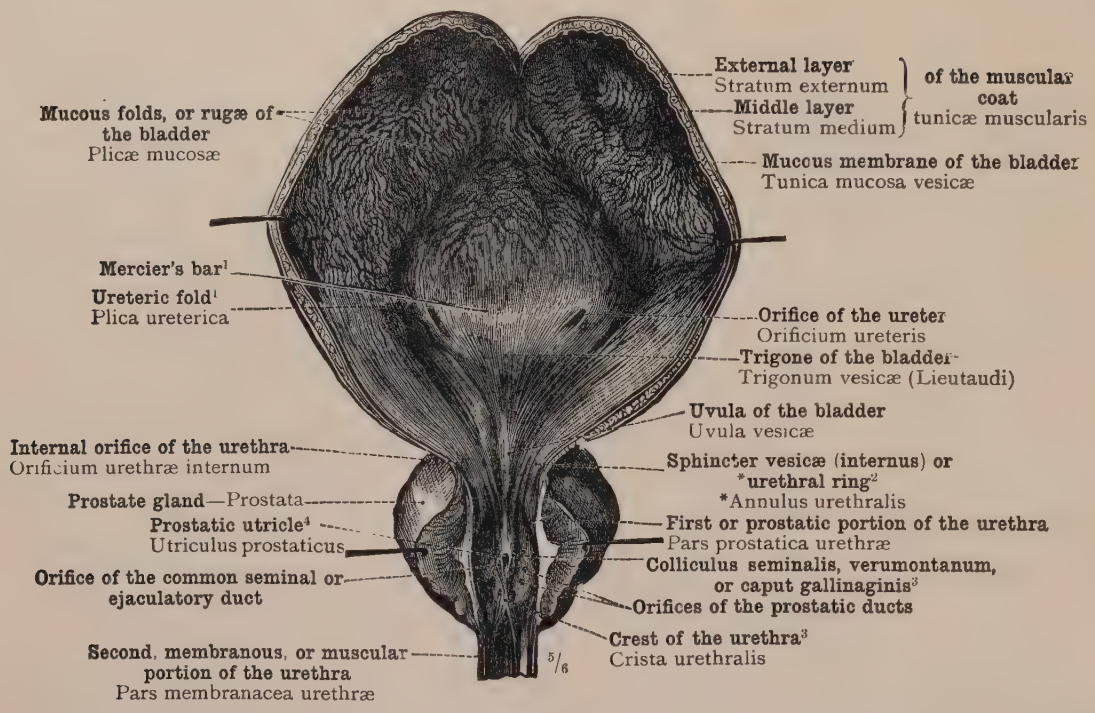


FIG. 842.—THE MALE BLADDER AND THE FIRST OR PROSTATIC PORTION OF THE URETHRA, WITH THE PROSTATE GLAND, OPENED FROM BEFORE.

The bladder was in a moderately distended state.

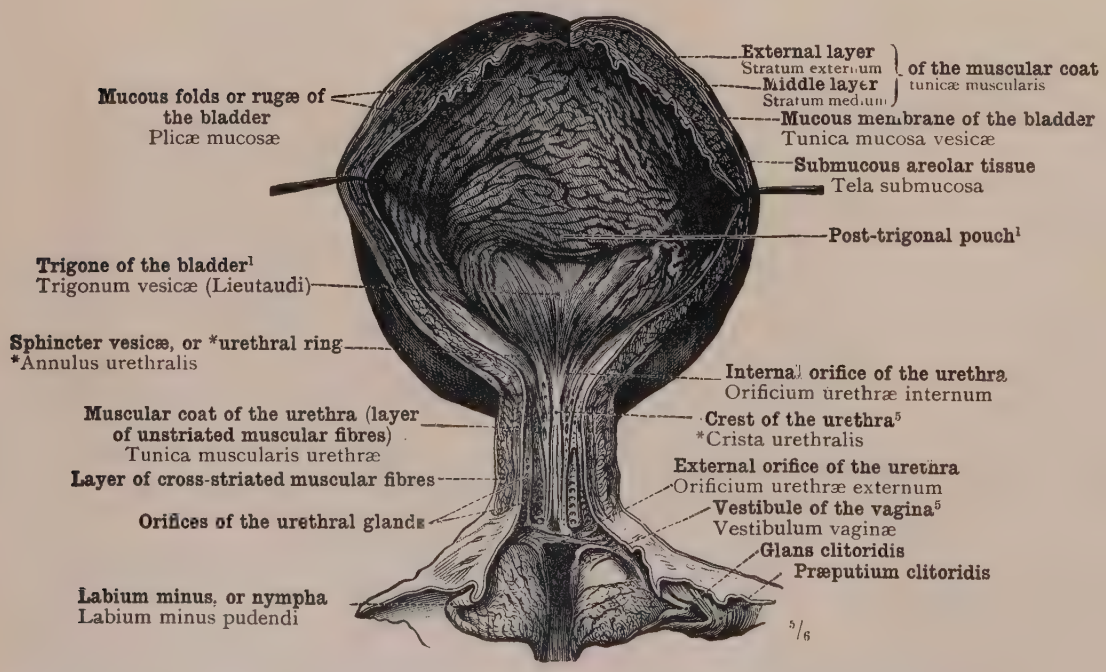


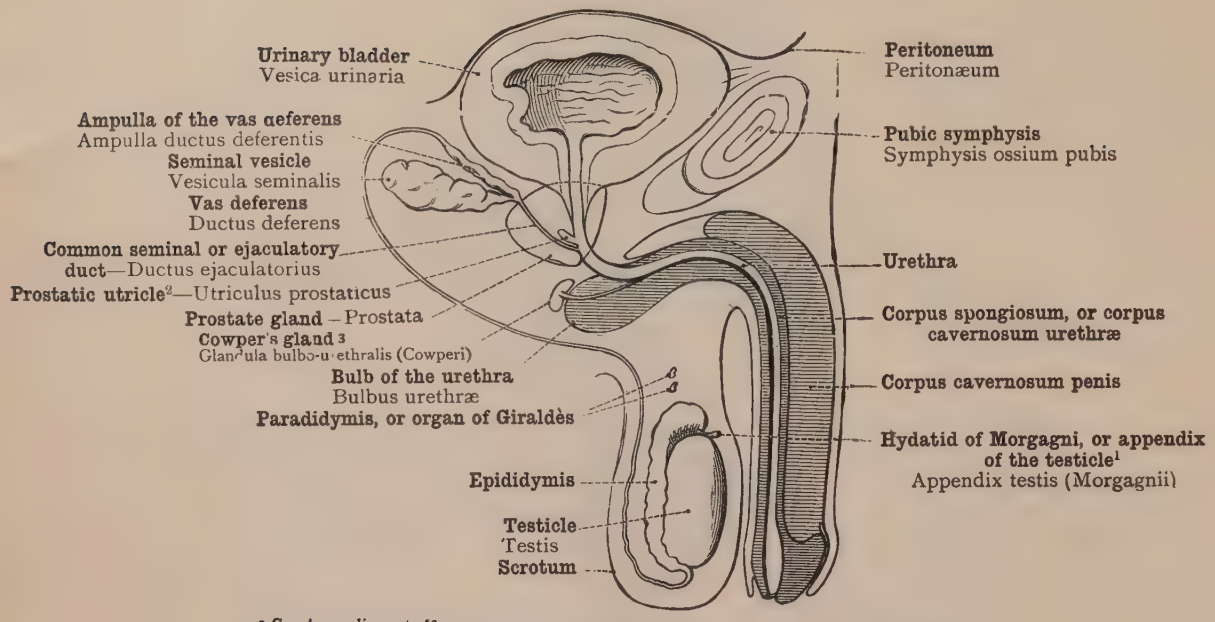
FIG. 843.—THE FEMALE BLADDER AND URETHRA, OPENED FROM BEFORE

The bladder was nearly empty, and contracted.

[1] See Appendix, note 61. [2] See Appendix, note 62. [3] See Appendix, note 63.
[4] See Appendix, note 64. [5] See Appendix, note 65.

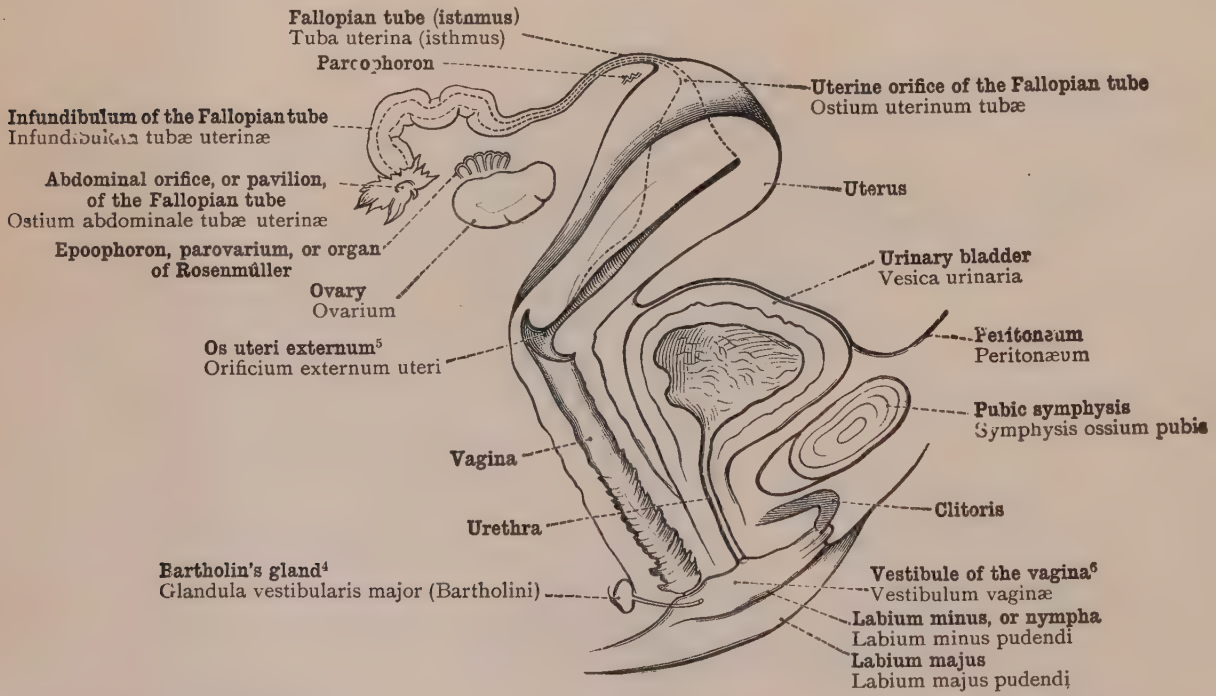
ORGANA GENITALIA VIRILIA

MALE REPRODUCTIVE ORGANS



[1] See Appendix, note [69].
[2] Known also as the *prostatic sinus*, *prostatic vesicle*, *sinus pocularis*, and *uterus masculinus*.
[3] Known also as the *suburethral gland*.

FIG. 844.—DIAGRAMMATIC REPRESENTATION OF THE MALE REPRODUCTIVE ORGANS AND THEIR RELATIONS TO THE BLADDER AND THE URETHRA. LATERAL VIEW.



[4] See Appendix, note [66].
[5] See Appendix, note [67].
[6] See Appendix, note [90].

FIG. 845.—DIAGRAMMATIC REPRESENTATION OF THE FEMALE REPRODUCTIVE ORGANS AND THEIR RELATIONS TO THE BLADDER AND URETHRA. LATERAL VIEW.

Comparative Diagrams of the Male and Female Reproductive Organs.

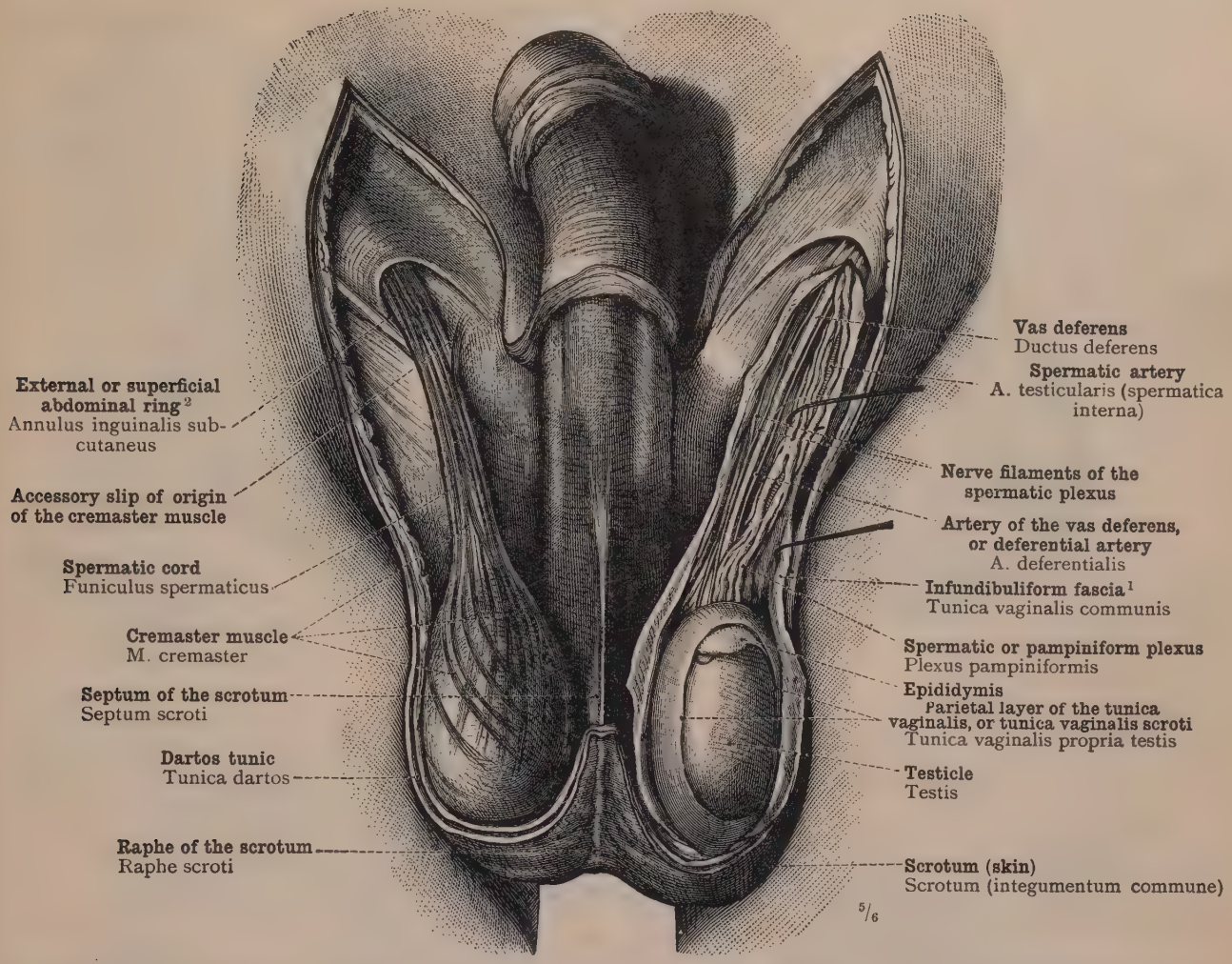


FIG. 846.—THE SCROTUM. THE PENIS HAS BEEN TURNED UPWARDS, AND THE ANTERIOR WALL OF THE SCROTUM HAS BEEN REMOVED. ON THE RIGHT SIDE, THE SPERMATIC CORD, THE INFUNDIBULIFORM FASCIA, AND THE CREMASTER MUSCLE, ARE DISPLAYED; ON THE LEFT SIDE, THE INFUNDIBULIFORM FASCIA HAS BEEN DIVIDED BY A LONGITUDINAL INCISION PASSING ALONG THE FRONT OF THE CORD AND THE TESTICLE, AND A PORTION OF THE TUNICA VAGINALIS SCROTI (PARIETAL LAYER OF THE TUNICA VAGINALIS) HAS BEEN REMOVED, TO DISPLAY THE TESTICLE AND A PORTION OF THE HEAD OR GLOBUS MAJOR OF THE EPIDIDYMIS, WHICH ARE COVERED BY THE TUNICA VAGINALIS TESTIS, OR VISCERAL LAYER OF THE TUNICA VAGINALIS.

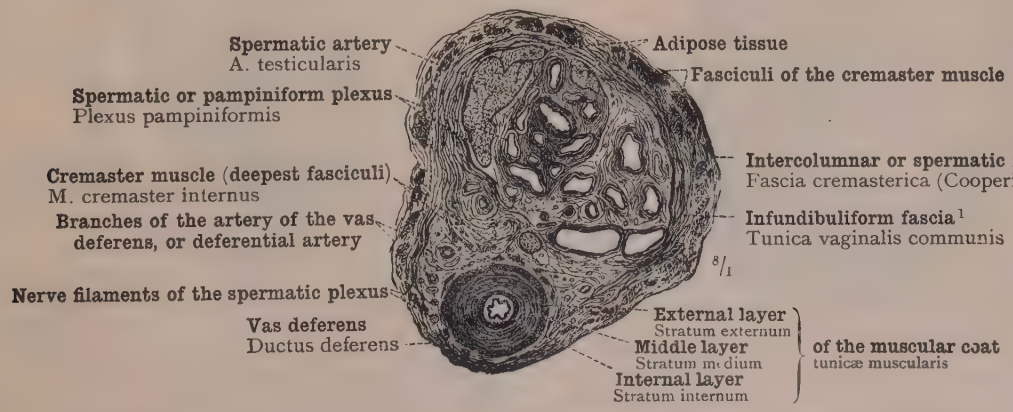


FIG. 847.—TRANSVERSE SECTION THROUGH THE SPERMATIC CORD NOT FAR FROM ITS EMERGENCE FROM THE INGUINAL CANAL.

[1] See Appendix, note 68.

[2] Known also as the *external inguinal aperture.*

Scrotum—The scrotum.—**Funiculus spermaticus**—The spermatic cord.

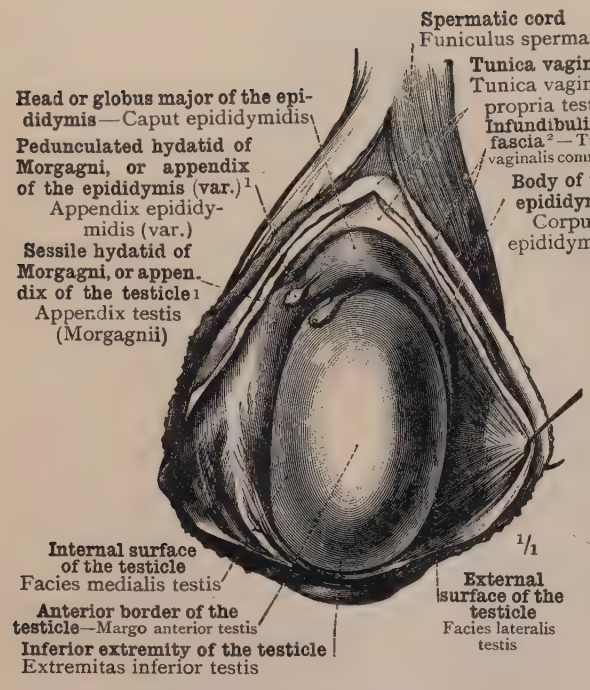

Spermatic cord
Funiculus spermaticus
Tunica vaginalis
Tunica vaginalis propria testis
Infundibuliform fascia[2]—Tunica vaginalis communis
Body of the epididymis
Corpus epididymidis
Head or globus major of the epididymis—Caput epididymidis
Pedunculated hydatid of Morgagni, or appendix of the epididymis (var.)[1]
Appendix epididymidis (var.)
Sessile hydatid of Morgagni, or appendix of the testicle[1]
Appendix testis (Morgagnii)
1/1
Internal surface of the testicle
Facies medialis testis
Anterior border of the testicle—Margo anterior testis
Inferior extremity of the testicle
Extremitas inferior testis
External surface of the testicle
Facies lateralis testis

FIG. 848.—THE LEFT TESTICLE WITH THE EPIDIDYMIS, THE INFUNDIBULIFORM FASCIA AND THE PARIETAL LAYER OF THE TUNICA VAGINALIS (TUNICA VAGINALIS SCROTI) HAVING BEEN DIVIDED. SEEN FROM BEFORE.

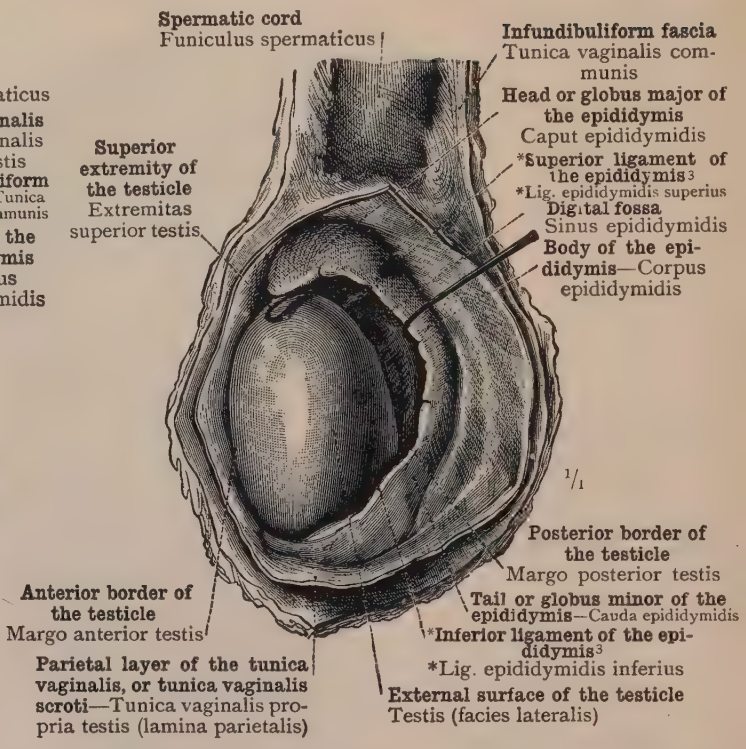

Spermatic cord
Funiculus spermaticus
Infundibuliform fascia
Tunica vaginalis communis
Head or globus major of the epididymis
Caput epididymidis
Superior extremity of the testicle
Extremitas superior testis
*Superior ligament of the epididymis[3]
*Lig. epididymidis superius
Digital fossa
Sinus epididymidis
Body of the epididymis—Corpus epididymidis
1/1
Posterior border of the testicle
Margo posterior testis
Tail or globus minor of the epididymis—Cauda epididymidis
*Inferior ligament of the epididymis[3]
*Lig. epididymidis inferius
Anterior border of the testicle
Margo anterior testis
Parietal layer of the tunica vaginalis, or tunica vaginalis scroti—Tunica vaginalis propria testis (lamina parietalis)
External surface of the testicle
Testis (facies lateralis)

FIG. 849.—THE LEFT TESTICLE WITH THE EPIDIDYMIS, THE LATTER BEING DRAWN A LITTLE BACKWARDS. THE INFUNDIBULIFORM FASCIA AND THE PARIETAL LAYER OF THE TUNICA VAGINALIS (TUNICA VAGINALIS SCROTI) HAVE BEEN DIVIDED. SEEN FROM THE OUTER SIDE.

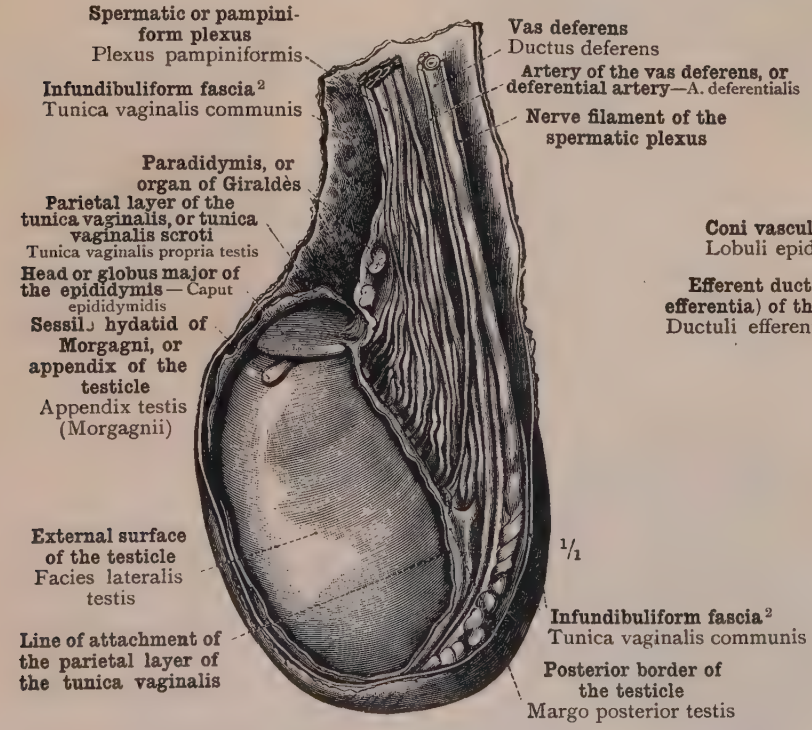

Spermatic or pampiniform plexus
Plexus pampiniformis
Vas deferens
Ductus deferens
Artery of the vas deferens, or deferential artery—A. deferentialis
Infundibuliform fascia[2]
Tunica vaginalis communis
Nerve filament of the spermatic plexus
Paradidymis, or organ of Giraldès
Parietal layer of the tunica vaginalis, or tunica vaginalis scroti
Tunica vaginalis propria testis
Head or globus major of the epididymis—Caput epididymidis
Sessile hydatid of Morgagni, or appendix of the testicle
Appendix testis (Morgagnii)
External surface of the testicle
Facies lateralis testis
1/1
Line of attachment of the parietal layer of the tunica vaginalis
Infundibuliform fascia[2]
Tunica vaginalis communis
Posterior border of the testicle
Margo posterior testis

FIG. 850.—THE TESTICLE WITH THE PAMPINIFORM PLEXUS, THE SEROUS SAC OF THE TESTICLE (TUNICA VAGINALIS) HAVING BEEN OPENED FROM THE INNER SIDE.

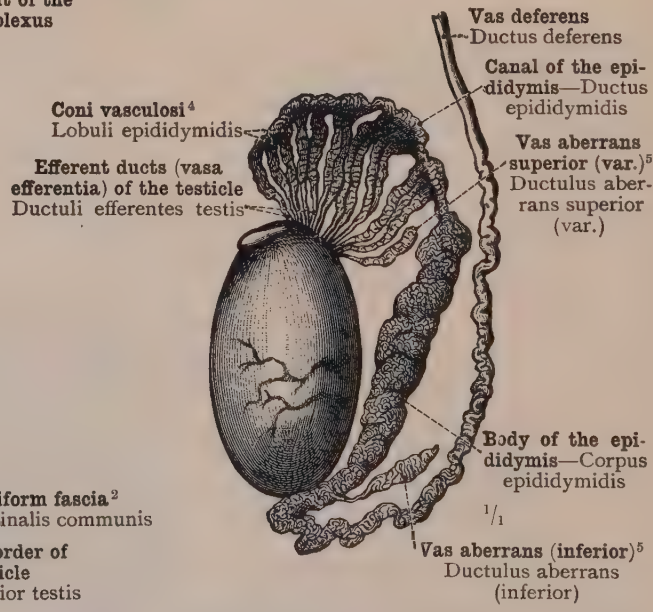


FIG. 851.—THE TESTICLE WITH ITS EFFERENT DUCTS AND THE CANAL OF THE EPIDIDYMIS DISSECTED OUT. SEEN FROM THE OUTER SIDE.

[1] See Appendix, note 69. [2] See Appendix, note 68. [3] See Appendix, note 70.
[4] See Appendix, note 73. [5] See Appendix, note 71.

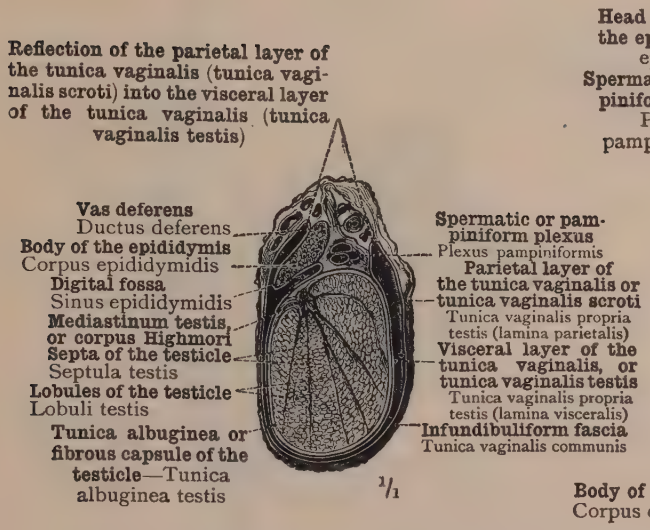

Reflection of the parietal layer of the tunica vaginalis (tunica vaginalis scroti) into the visceral layer of the tunica vaginalis (tunica vaginalis testis)
Vas deferens
Ductus deferens
Body of the epididymis
Corpus epididymidis
Digital fossa
Sinus epididymidis
Mediastinum testis, or corpus Highmori
Septa of the testicle
Septula testis
Lobules of the testicle
Lobuli testis
Tunica albuginea or fibrous capsule of the testicle—Tunica albuginea testis
Spermatic or pampiniform plexus
Plexus pampiniformis
Parietal layer of the tunica vaginalis or tunica vaginalis scroti
Tunica vaginalis propria testis (lamina parietalis)
Visceral layer of the tunica vaginalis, or tunica vaginalis testis
Tunica vaginalis propria testis (lamina visceralis)
Infundibuliform fascia
Tunica vaginalis communis
1/1

FIG. 852.—HORIZONTAL SECTION THROUGH THE RIGHT TESTICLE AND THE EPIDIDYMIS, AND THROUGH THE TUNICA VAGINALIS AND THE INFUNDIBULIFORM FASCIA.

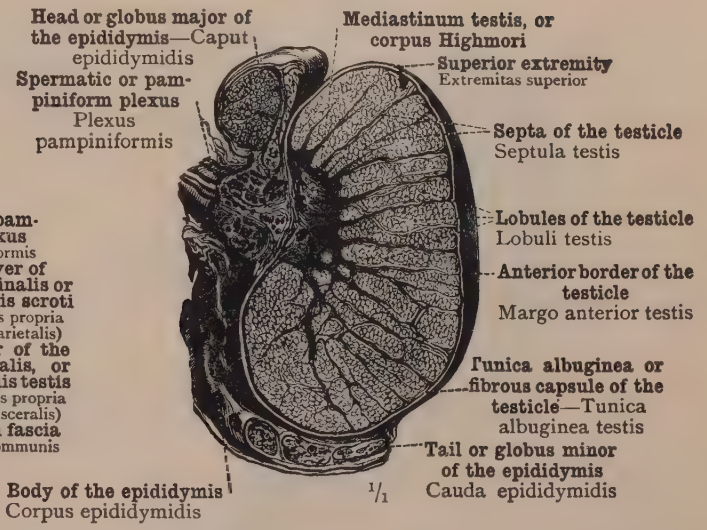


FIG. 853.—SAGITTAL SECTION THROUGH THE MIDDLE OF THE RIGHT TESTICLE. THE MEDIASTINUM TESTIS, OR CORPUS HIGHMORI.

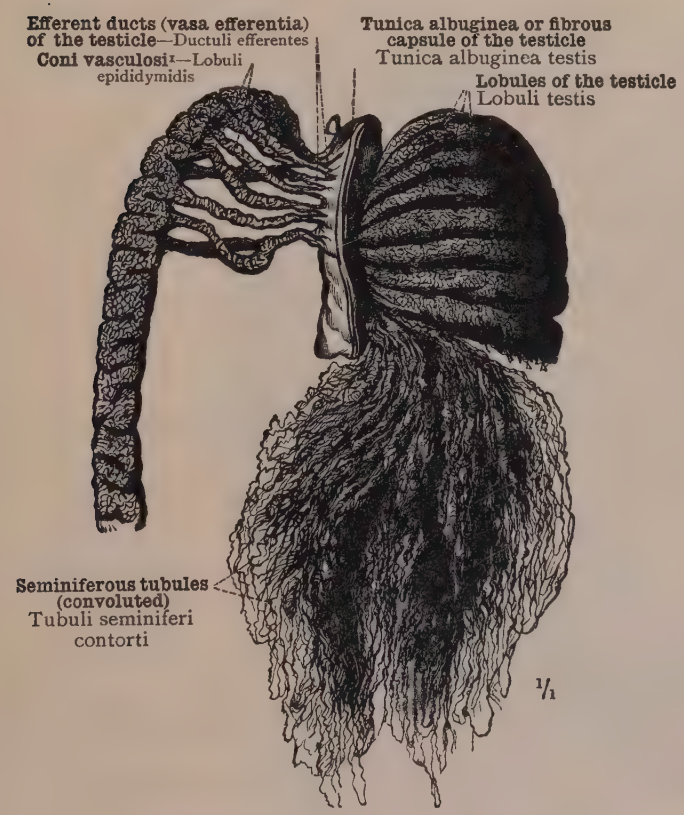
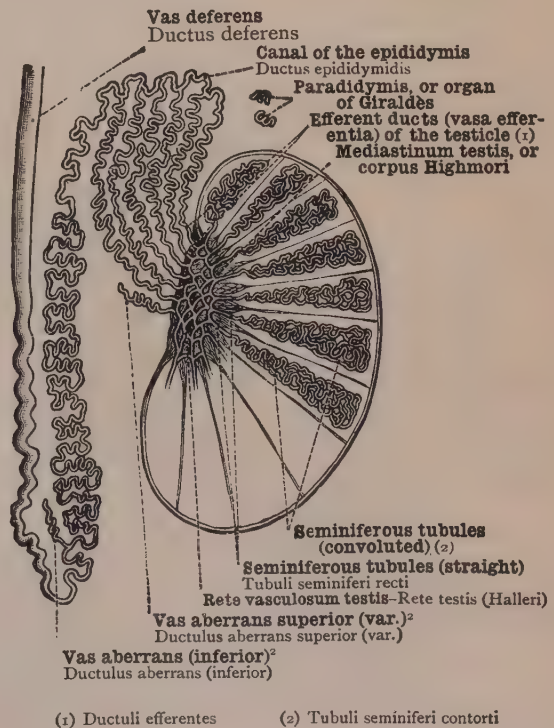


FIG. 854.—THE PARENCHYMA OF THE TESTICLE, PARTIALLY ISOLATED BY MACERATION IN HYDROCHLORIC ACID SOLUTION.

[1] See Appendix, note 72.



(1) Ductuli efferentes (2) Tubuli seminiferi contorti

FIG. 855.—DIAGRAMMATIC REPRESENTATION OF THE COURSE AND CONNEXIONS OF THE TUBULES OF THE TESTICLE AND THE EPIDIDYMIS.

[2] See Appendix, note 71.

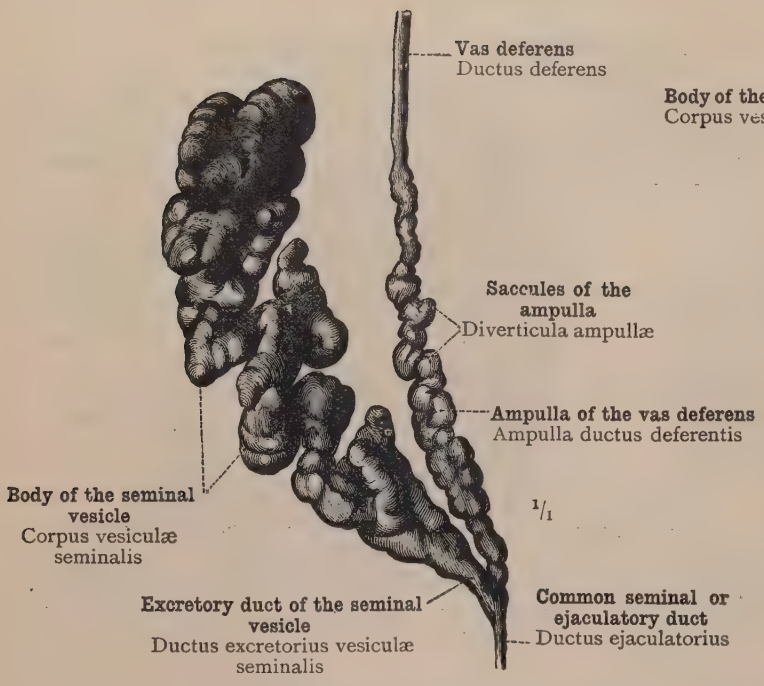


FIG. 856.—CAST OF THE INTERIOR OF THE RIGHT SEMINAL VESICLE, THE AMPULLA OF THE VAS DEFERENS, AND THE COMMON SEMINAL OR EJACULATORY DUCT.

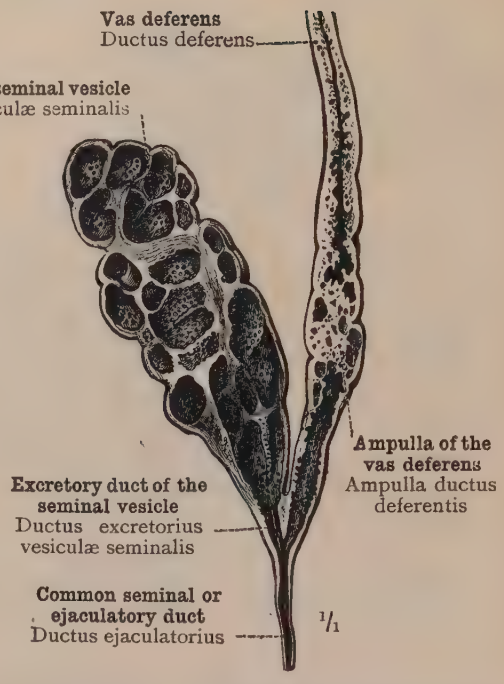
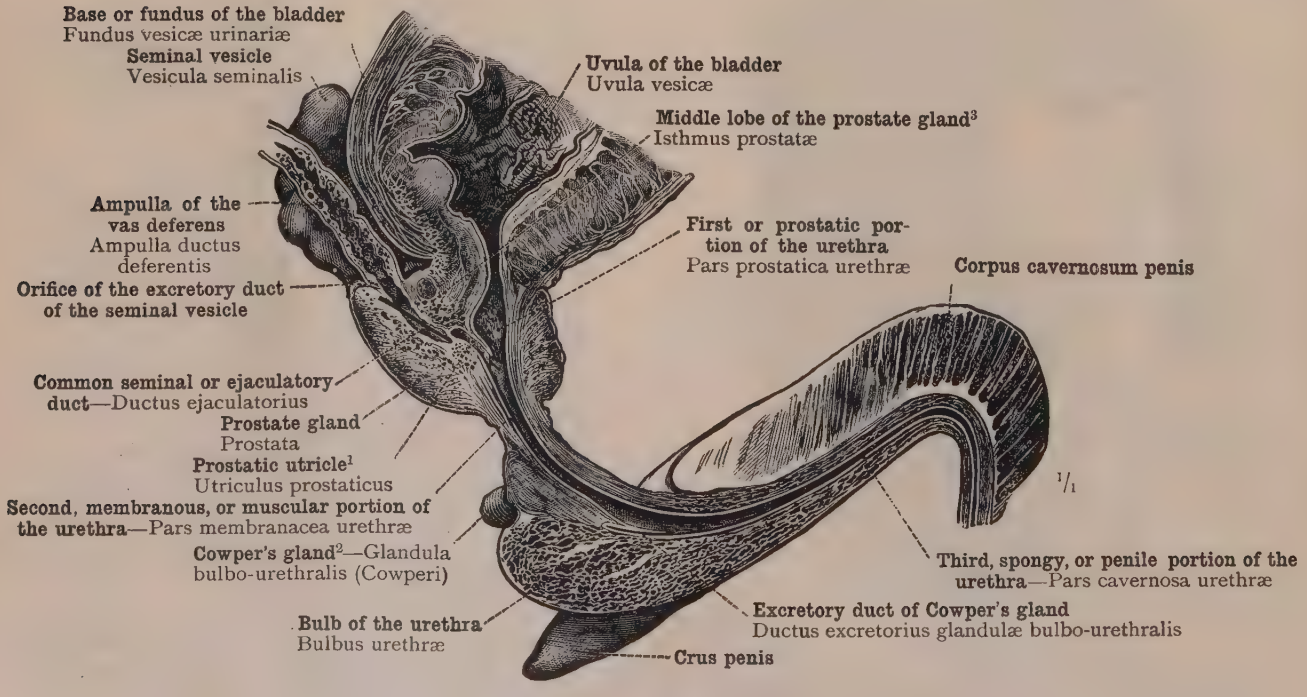


FIG. 857.—LONGITUDINAL SECTION THROUGH THE RIGHT SEMINAL VESICLE, THE AMPULLA OF THE VAS DEFERENS, AND THE COMMON SEMINAL OR EJACULATORY DUCT.


Base or fundus of the bladder
Fundus vesicæ urinariæ
Seminal vesicle
Vesicula seminalis
Uvula of the bladder
Uvula vesicæ
Middle lobe of the prostate gland[3]
Isthmus prostatæ
Ampulla of the vas deferens
Ampulla ductus deferentis
Orifice of the excretory duct of the seminal vesicle
First or prostatic portion of the urethra
Pars prostatica urethræ
Corpus cavernosum penis
Common seminal or ejaculatory duct—Ductus ejaculatorius
Prostate gland
Prostata
Prostatic utricle[1]
Utriculus prostaticus
Second, membranous, or muscular portion of the urethra—Pars membranacea urethræ
Cowper's gland[2]—Glandula bulbo-urethralis (Cowperi)
1/1
Third, spongy, or penile portion of the urethra—Pars cavernosa urethræ
Excretory duct of Cowper's gland
Ductus excretorius glandulæ bulbo-urethralis
Bulb of the urethra
Bulbus urethræ
Crus penis

[1] Known also as the *prostatic sinus, prostatic vesicle, sinus pocularis,* and *uterus masculinus.*
[2] Known also as the *suburethral gland.*
[3] See Appendix, note 73.

FIG. 858.—SAGITTAL SECTION THROUGH THE MALE URETHRA. LEFT HALF. URETHRAL ORIFICES OF THE COMMON SEMINAL OR EJACULATORY DUCT AND THE EXCRETORY DUCT OF COWPER'S GLAND (*see note* [2] *above*). THE PROSTATIC UTRICLE (*see note* [1] *above*).

Vesicula seminalis—The seminal vesicle.—**Ductus deferens**—The vas deferens.—**Ductus ejaculatorius**—The common seminal or ejaculatory duct.

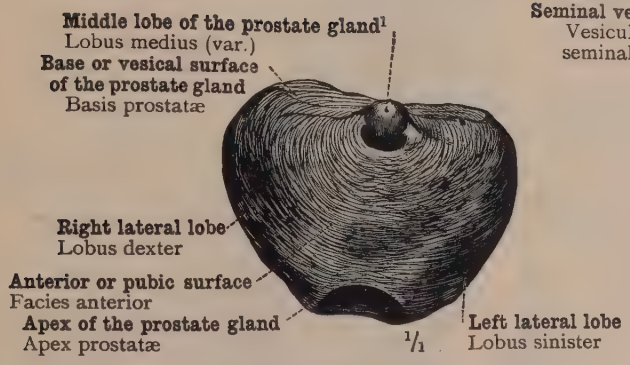


FIG. 859.—THE PROSTATE GLAND, ISOLATED AND SEEN FROM BEFORE.

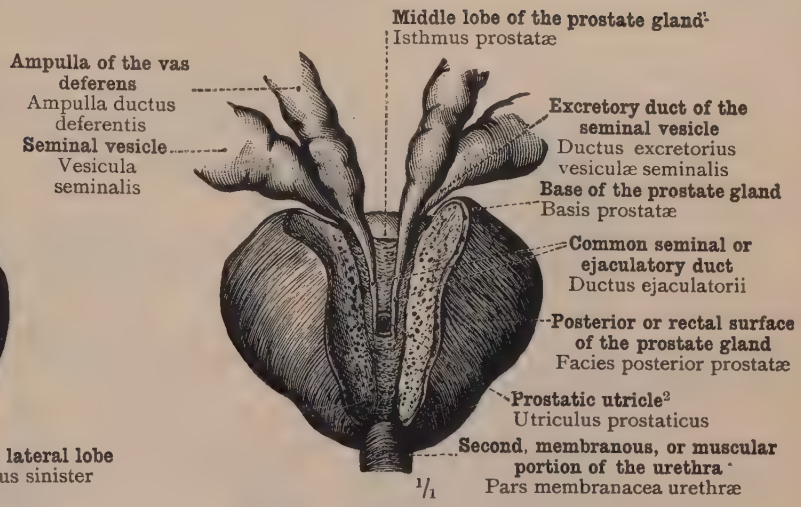


FIG. 860.—THE COMMON SEMINAL OR EJACULATORY DUCTS AND THE BLIND EXTREMITY OF THE PROSTATIC UTRICLE, LAID BARE FROM BEHIND BY THE REMOVAL OF A PORTION OF THE PROSTATE GLAND.

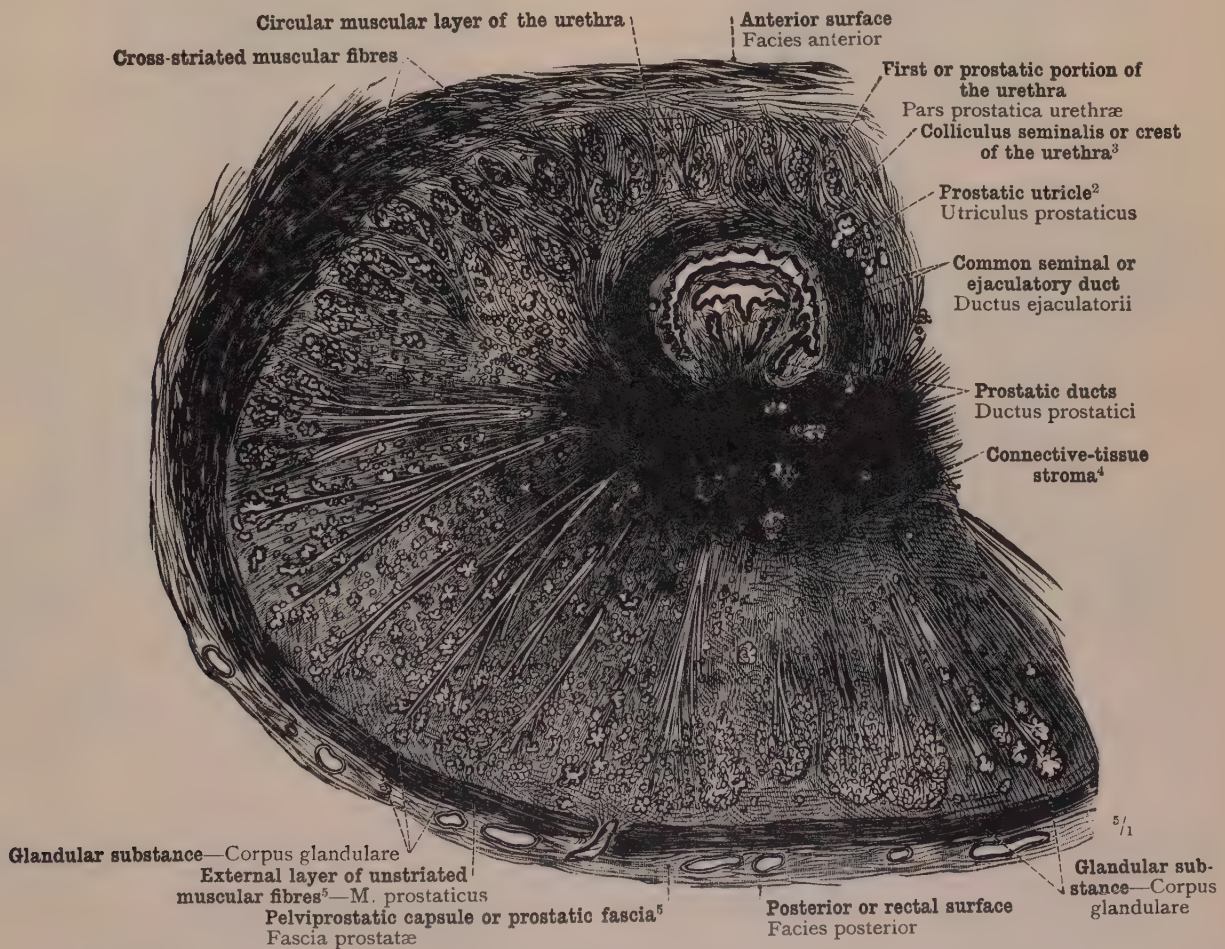
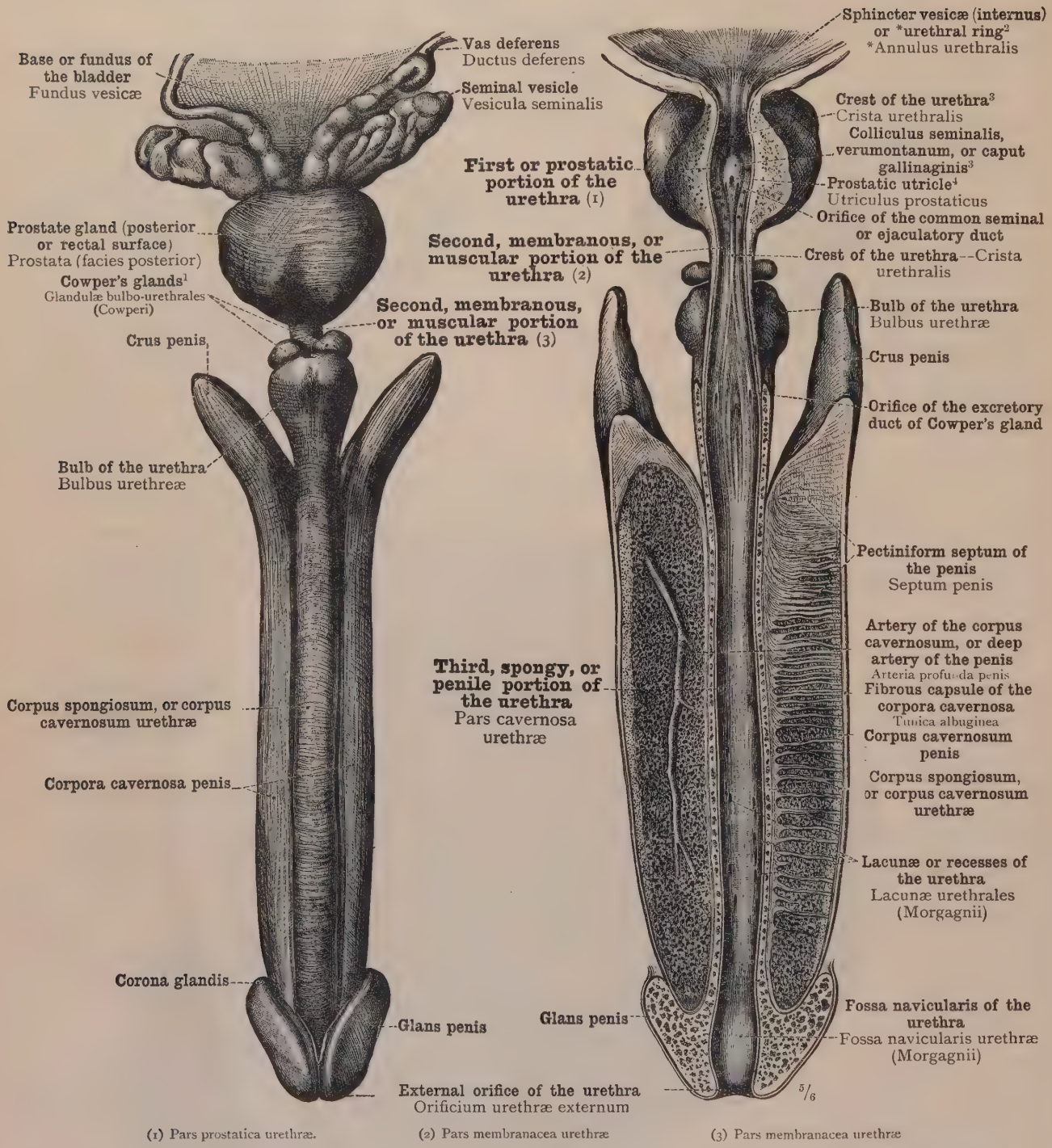


FIG. 861.—HORIZONTAL SECTION THROUGH THE MIDDLE OF THE PROSTATE GLAND OF A MUSCULAR MAN TWENTY-FOUR YEARS OF AGE TRANSVERSE SECTION OF THE COLLICULUS SEMINALIS OR CREST OF THE URETHRA.[3]

[1] See Appendix, note 73.
[2] Known also as the *prostatic sinus*, *prostatic vesicle*, *sinus pocularis*, and *uterus masculinus*.
[3] Known also as the *verumontanum* or *caput gallinaginis*. See Appendix, note 63.
[4] This so-called connective-tissue stroma (*Bindgewebsstroma*, Toldt) of the prostate gland consists chiefly of unstriated muscular fibres.—TR
[5] See Appendix, note 74.

Prostata—The prostate gland.—Ductus ejaculatorii—The common seminal or ejaculatory ducts.


Base or fundus of the bladder
Fundus vesicæ
Vas deferens
Ductus deferens
Seminal vesicle
Vesicula seminalis
Prostate gland (posterior or rectal surface)
Prostata (facies posterior)
Cowper's glands[1]
Glandulæ bulbo-urethrales (Cowperi)
Crus penis
Bulb of the urethra
Bulbus urethreæ
Corpus spongiosum, or corpus cavernosum urethræ
Corpora cavernosa penis
Corona glandis
Glans penis
External orifice of the urethra
Orificium urethræ externum
First or prostatic portion of the urethra (1)
Second, membranous, or muscular portion of the urethra (2)
Second, membranous, or muscular portion of the urethra (3)
Third, spongy, or penile portion of the urethra
Pars cavernosa urethræ
Sphincter vesicæ (internus) or *urethral ring[2]
*Annulus urethralis
Crest of the urethra[3]
Crista urethralis
Colliculus seminalis, verumontanum, or caput gallinaginis[3]
Prostatic utricle[4]
Utriculus prostaticus
Orifice of the common seminal or ejaculatory duct
Crest of the urethra--Crista urethralis
Bulb of the urethra
Bulbus urethræ
Crus penis
Orifice of the excretory duct of Cowper's gland
Pectiniform septum of the penis
Septum penis
Artery of the corpus cavernosum, or deep artery of the penis
Arteria profunda penis
Fibrous capsule of the corpora cavernosa
Tunica albuginea
Corpus cavernosum penis
Corpus spongiosum, or corpus cavernosum urethræ
Lacunæ or recesses of the urethra
Lacunæ urethrales (Morgagnii)
Glans penis
Fossa navicularis of the urethra
Fossa navicularis urethræ (Morgagnii)
5/6

(1) Pars prostatica urethræ. (2) Pars membranacea urethræ (3) Pars membranacea urethræ

FIG. 862.—THE PENIS, WITH THE URETHRA, COWPER'S GLANDS,[1] THE PROSTATE GLAND, AND THE SEMINAL VESICLES, SEEN FROM BELOW AND BEHIND.

FIG. 863.—THE MALE URETHRA, OPENED FROM ABOVE AND BEFORE BY A SAGITTAL SECTION CLOSE TO THE PECTINIFORM SEPTUM OF THE PENIS.

[1] Known also as the *suburethral glands*. [2] See Appendix, note 62. [3] See Appendix, note 63.
[4] Known also as the *prostatic sinus*, *prostatic vesicle*, *sinus pocularis*, and *uterus masculinus*.

Penis—The penis.—Urethra virilis—The male urethra.

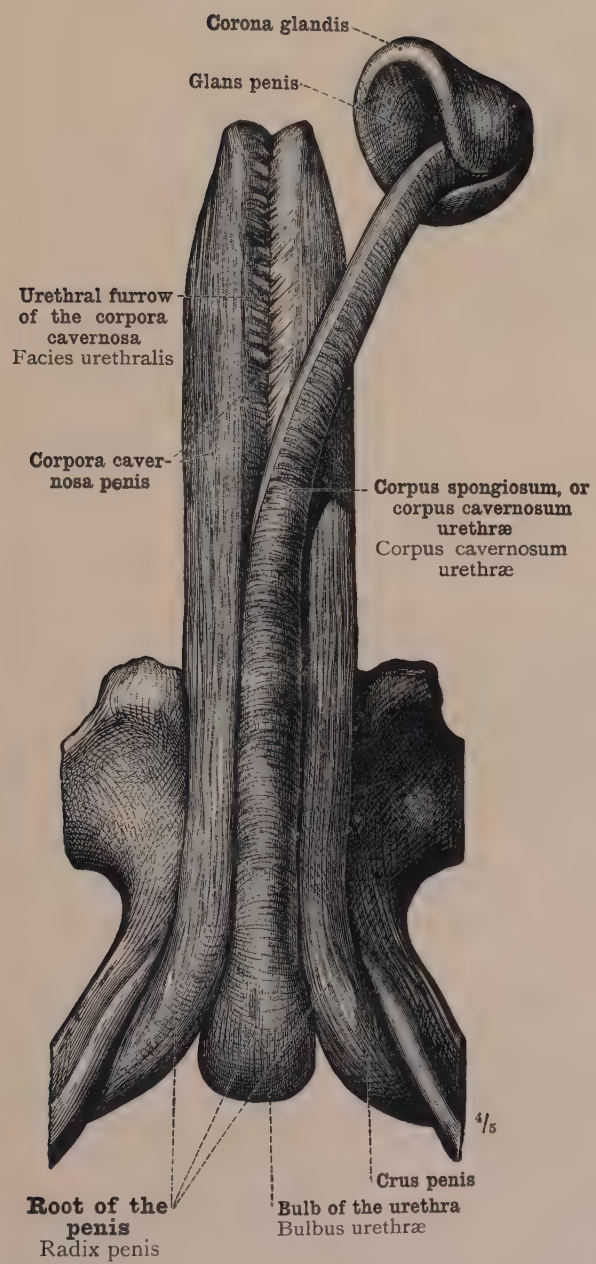


FIG. 864.—THE PENIS, WITH THE PUBIC BONES. SEEN FROM BEFORE AND BELOW.

The corpus spongiosum, or corpus cavernosum urethræ, with the glans penis, has been separated from the corpora cavernosa penis for the anterior half of its extent, and turned to one side.

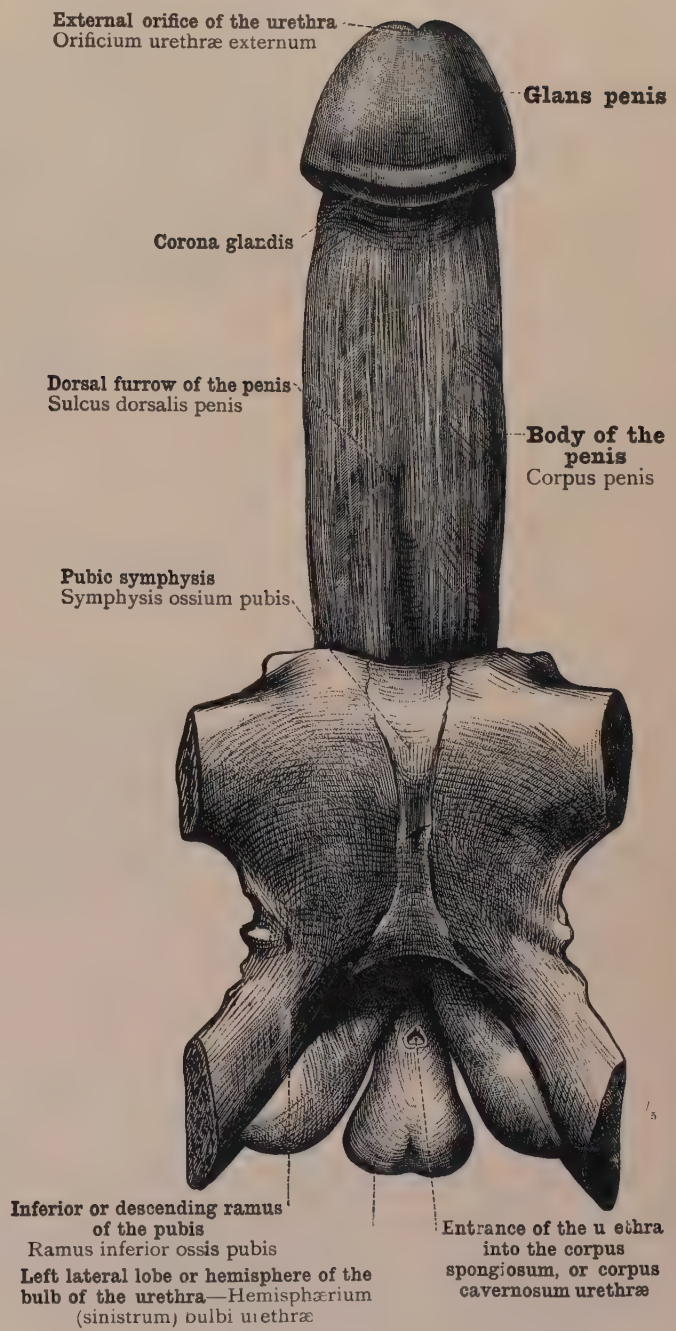

External orifice of the urethra
Orificium urethræ externum
Glans penis
Corona glandis
Dorsal furrow of the penis
Sulcus dorsalis penis
Body of the penis
Corpus penis
Pubic symphysis
Symphysis ossium pubis
1/5
Inferior or descending ramus of the pubis
Ramus inferior ossis pubis
Left lateral lobe or hemisphere of the bulb of the urethra—Hemisphærium (sinistrum) bulbi urethræ
Entrance of the urethra into the corpus spongiosum, or corpus cavernosum urethræ

FIG. 865.—THE PENIS, WITH THE PUBIC BONES. SEEN FROM ABOVE AND BEHIND.

The urethra has been cut away at its entrance into the corpus spongiosum, or corpus cavernosum urethræ.

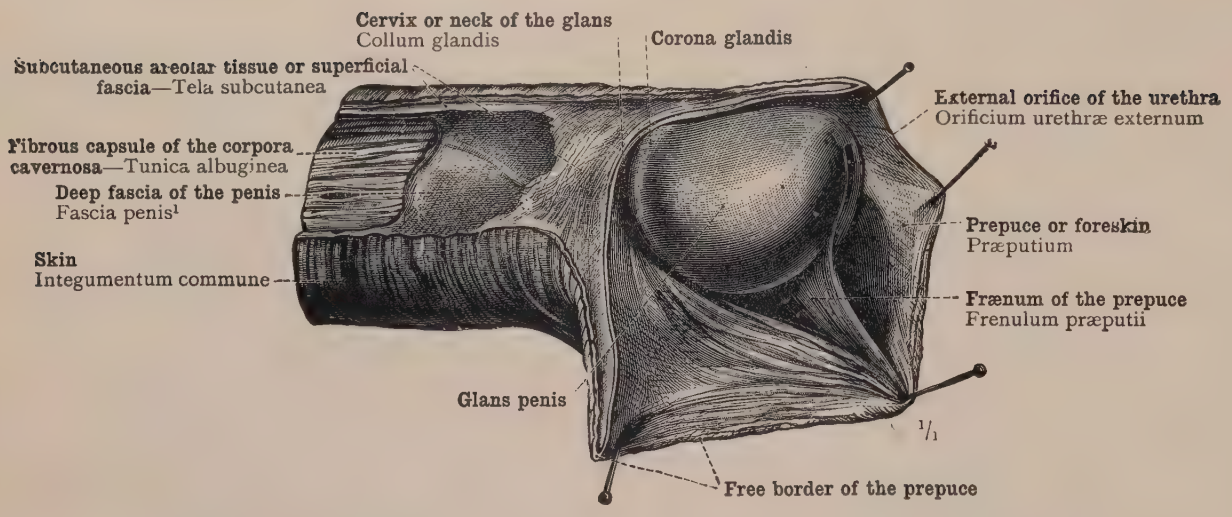


FIG. 866.—FREE PORTION, OR BODY, OF THE PENIS SEEN FROM THE RIGHT SIDE.

The skin has been divided along the dorsum of the penis, and the right half of the prepuce or foreskin has been turned downwards. The subcutaneous areolar tissue or superficial fascia and the deep fascia have been partially removed.

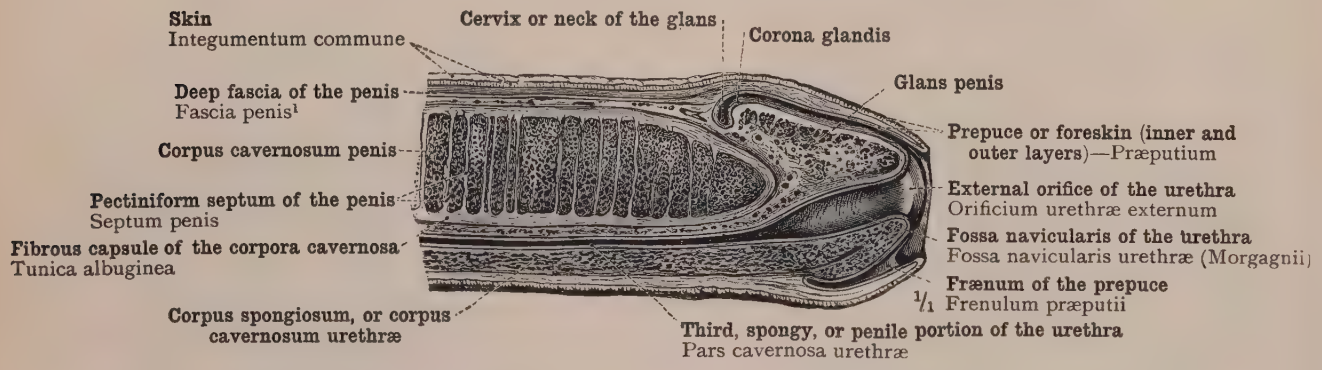
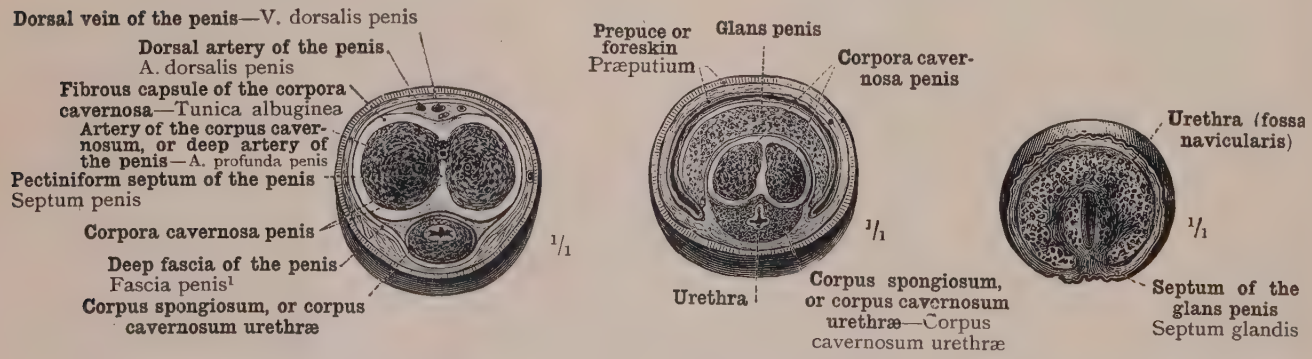


FIG. 867.—MEDIAN SAGITTAL SECTION THROUGH THE FREE PORTION, OR BODY, OF THE PENIS.



MIDDLE OF THE PENIS. ANTERIOR PORTION OF THE GLANS PENIS. POSTERIOR PORTION OF THE GLANS PENIS.

FIG. 868.—TRANSVERSE SECTIONS THROUGH THE PENIS.

[1] *Fascia Penis.*—This term, as used by the author, denotes not only the *deep fascia of the penis* of English anatomists, which forms a sheath for the free portion or *body* of the penis, but also the fascial layer (structurally continuous with the deep fascia of the penis) which covers the root of the organ, and belongs to the perineum. This latter is usually known in England by the name of *Colles's fascia.* See Fig. 914, p. 526, and note [2] on that page.—TR.

ORGANA GENITALIA MULIEBRIA

FEMALE REPRODUCTIVE ORGANS

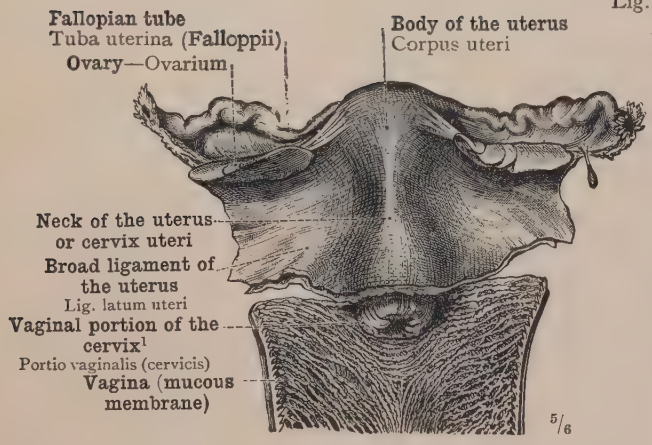


FIG. 869.—INTERNAL GENITAL ORGANS OF A NEWBORN, POWERFULLY-DEVELOPED FEMALE INFANT. SEEN FROM BEHIND.

The posterior wall of the vagina has been divided by a median longitudinal incision and the segments turned to the right and the left.

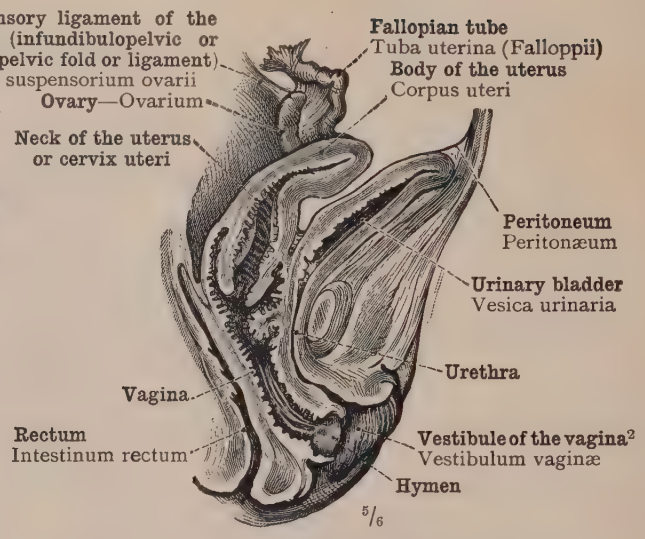


FIG. 870.—REPRODUCTIVE ORGANS OF A NEWBORN, POWERFULLY-DEVELOPED FEMALE INFANT IN MEDIAN SAGITTAL SECTION. LEFT HALF.

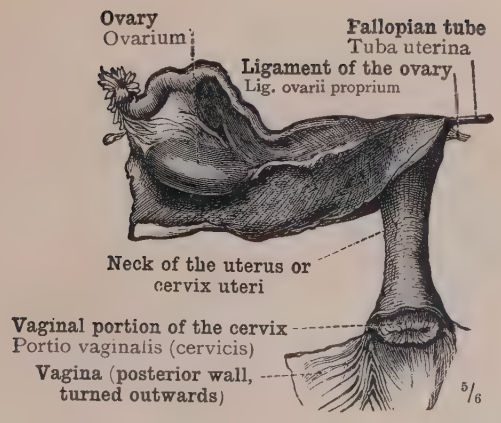


FIG. 871.—INTERNAL GENITAL ORGANS OF A GIRL AGED EIGHT YEARS. SEEN FROM BEHIND.

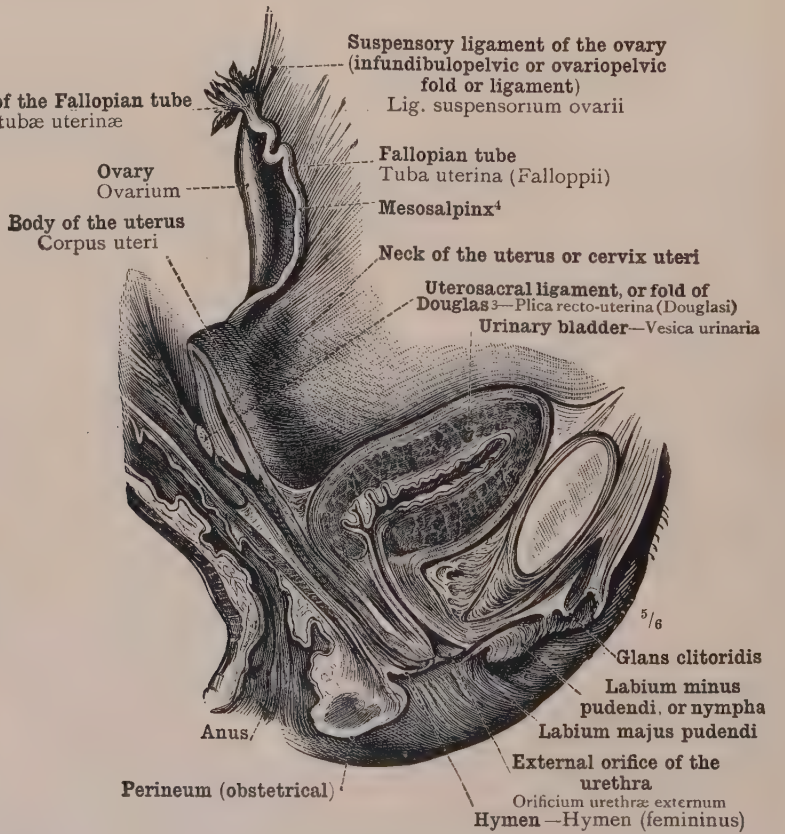


FIG. 872.—REPRODUCTIVE ORGANS OF A GIRL AGED TEN YEARS IN MEDIAN SAGITTAL SECTION. LEFT HALF.

[1] See Appendix, note 75.
[2] See Appendix, note 90.
[3] Known also as the *recto-uterine fold* or *ligament*. It forms the lateral boundary of the *pouch of Douglas*, and must be distinguished from the *rectovaginal ligament*, which forms the floor of that pouch.—TR.
[4] See Appendix, note 82.

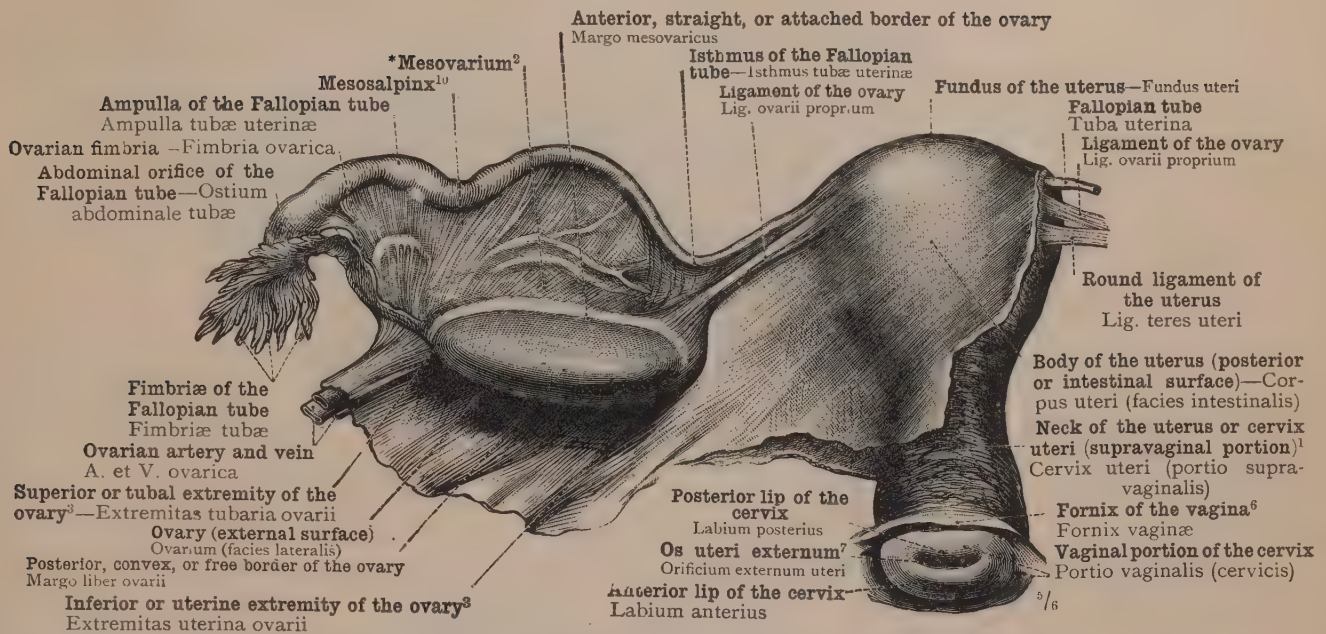

Anterior, straight, or attached border of the ovary
Margo mesovaricus
*Mesovarium[2]
Mesosalpinx[10]
Isthmus of the Fallopian tube—Isthmus tubæ uterinæ
Ligament of the ovary
Lig. ovarii proprium
Fundus of the uterus—Fundus uteri
Fallopian tube
Tuba uterina
Ligament of the ovary
Lig. ovarii proprium
Ampulla of the Fallopian tube
Ampulla tubæ uterinæ
Ovarian fimbria—Fimbria ovarica
Abdominal orifice of the Fallopian tube—Ostium abdominale tubæ
Round ligament of the uterus
Lig. teres uteri
Body of the uterus (posterior or intestinal surface)—Corpus uteri (facies intestinalis)
Neck of the uterus or cervix uteri (supravaginal portion)[1]
Cervix uteri (portio supravaginalis)
Fimbriæ of the Fallopian tube
Fimbriæ tubæ
Ovarian artery and vein
A. et V. ovarica
Superior or tubal extremity of the ovary[3]—Extremitas tubaria ovarii
Ovary (external surface)
Ovarium (facies lateralis)
Posterior, convex, or free border of the ovary
Margo liber ovarii
Inferior or uterine extremity of the ovary[3]
Extremitas uterina ovarii
Posterior lip of the cervix
Labium posterius
Os uteri externum[7]
Orificium externum uteri
Anterior lip of the cervix
Labium anterius
Fornix of the vagina[6]
Fornix vaginæ
Vaginal portion of the cervix
Portio vaginalis (cervicis)
5/6

FIG. 873.—THE UTERUS, THE LEFT FALLOPIAN TUBE, AND THE LEFT OVARY, IN THEIR CONNEXION WITH THE BROAD LIGAMENT OF THE UTERUS, WHICH HAS BEEN FULLY UNFOLDED.[3] SEEN FROM BEHIND. FROM A VIRGIN, AGED NINETEEN YEARS.

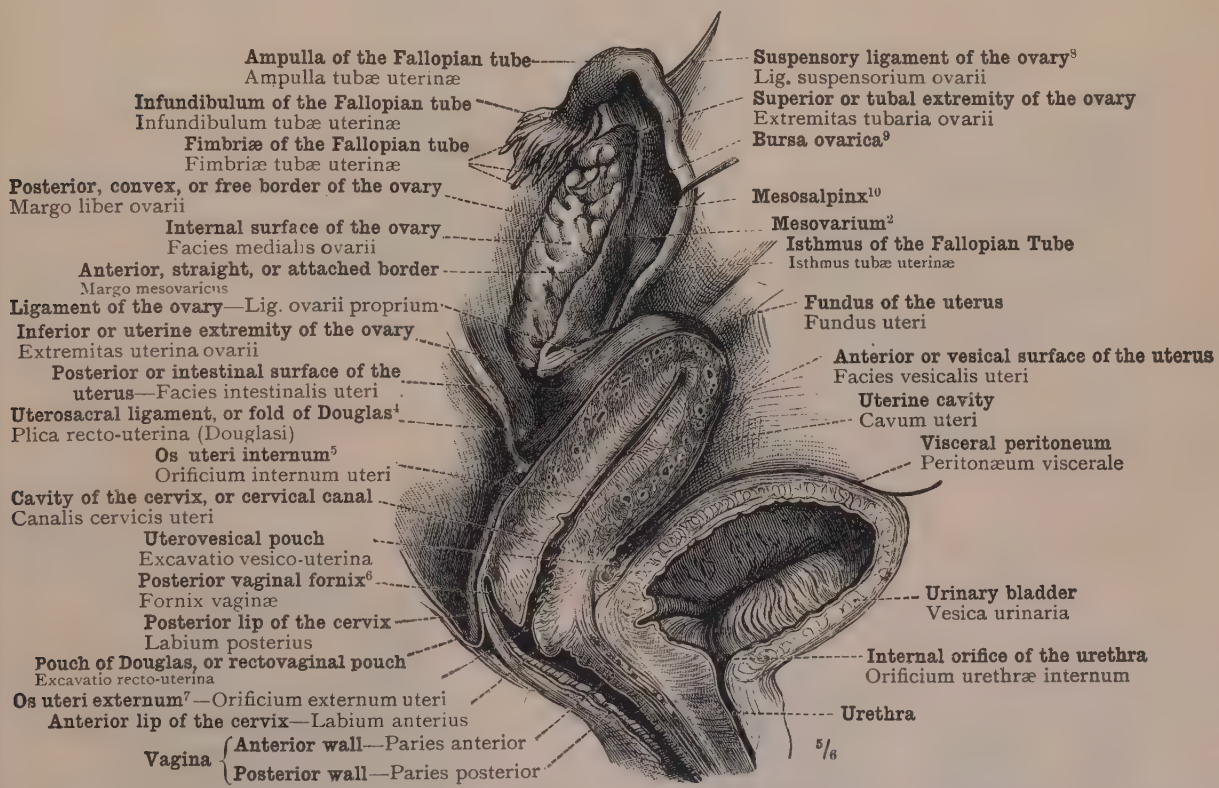


FIG. 874.—INTERNAL GENITAL ORGANS OF A WOMAN AGED THIRTY-FIVE YEARS. UTERUS, VAGINA, AND BLADDER IN MEDIAN SAGITTAL SECTION. LEFT OVARY AND FALLOPIAN TUBE, BY THE DRAWING APART OF WHICH THE BURSA OVARICA HAS BEEN OPENED UP.

1 See Appendix, note 75. 2 See Appendix, note 76. 3 See Appendix, note 77. 4 See note 3 to p. 510.
5 Known also as the *isthmus uteri*, or *isthmus of the uterine cavity*, and sometimes as *ostium uteri*.
6 See Appendix, note 78. 7 See Appendix, note 67.
8 Known also as the *infundibulopelvic* or *ovariopelvic fold or ligament*. 9 See Appendix, note 72
10 See Appendix, note 82.

Female Internal Genital Organs in the Fully Developed State.

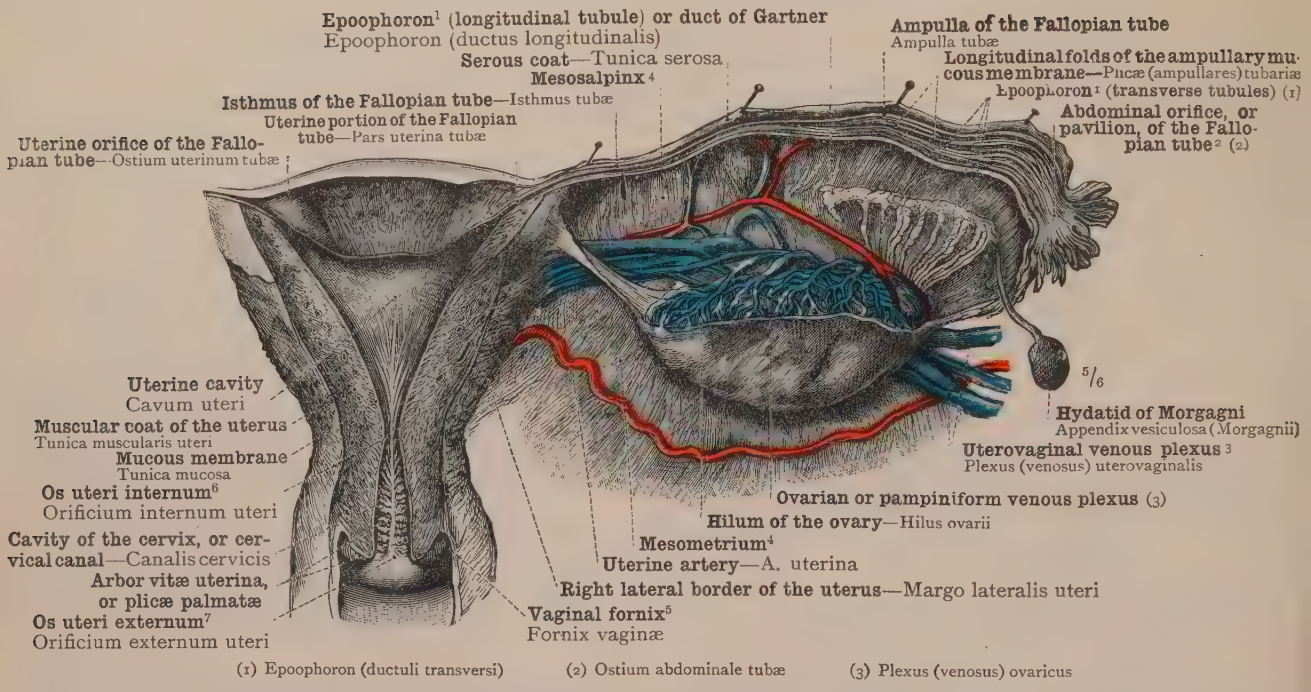

Epoophoron[1] (longitudinal tubule) or duct of Gartner
Epoophoron (ductus longitudinalis)
Serous coat—Tunica serosa
Mesosalpinx[4]
Isthmus of the Fallopian tube—Isthmus tubæ
Uterine portion of the Fallopian tube—Pars uterina tubæ
Uterine orifice of the Fallopian tube—Ostium uterinum tubæ
Ampulla of the Fallopian tube
Ampulla tubæ
Longitudinal folds of the ampullary mucous membrane—Plicæ (ampullares) tubariæ
Epoophoron[1] (transverse tubules) (1)
Abdominal orifice, or pavilion, of the Fallopian tube[2] (2)
5/6
Hydatid of Morgagni
Appendix vesiculosa (Morgagnii)
Uterovaginal venous plexus[3]
Plexus (venosus) uterovaginalis
Ovarian or pampiniform venous plexus (3)
Hilum of the ovary—Hilus ovarii
Mesometrium[4]
Uterine artery—A. uterina
Right lateral border of the uterus—Margo lateralis uteri
Vaginal fornix[5]
Fornix vaginæ
Uterine cavity
Cavum uteri
Muscular coat of the uterus
Tunica muscularis uteri
Mucous membrane
Tunica mucosa
Os uteri internum[6]
Orificium internum uteri
Cavity of the cervix, or cervical canal—Canalis cervicis
Arbor vitæ uterina, or plicæ palmatæ
Os uteri externum[7]
Orificium externum uteri
(1) Epoophoron (ductuli transversi)
(2) Ostium abdominale tubæ
(3) Plexus (venosus) ovaricus

FIG. 875.—THE UTERUS AND THE RIGHT FALLOPIAN TUBE, OPENED FROM BEHIND. EPOOPHORON, PAROVARIUM, OR ORGAN OF ROSENMÜLLER.

The posterior layer of the broad ligament of the uterus has been removed.

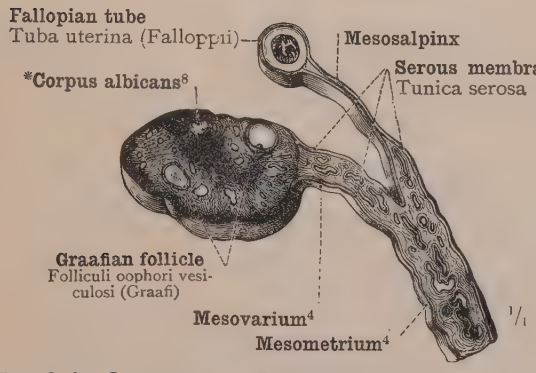


FIG. 876.—LIGAMENTUM LATUM UTERI, THE BROAD LIGAMENT OF THE UTERUS, WITH THE MESOVARIUM THE MESOSALPINX, THE OVARY, AND THE FALLOPIAN TUBE, IN TRANSVERSE SECTION.

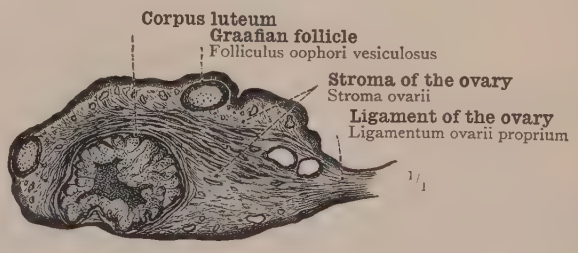


FIG. 877.—LONGITUDINAL SECTION THROUGH THE OVARY.

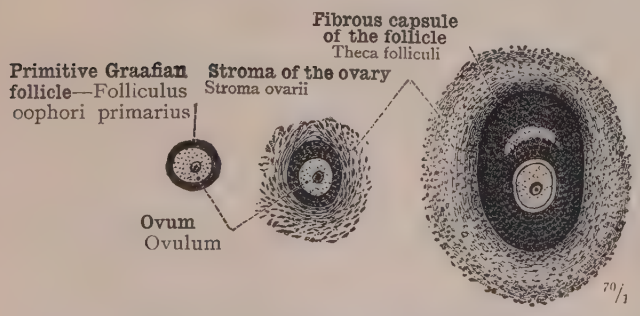


FIG. 878.—STAGES IN THE DEVELOPMENT OF THE PRIMITIVE GRAAFIAN FOLLICLES.

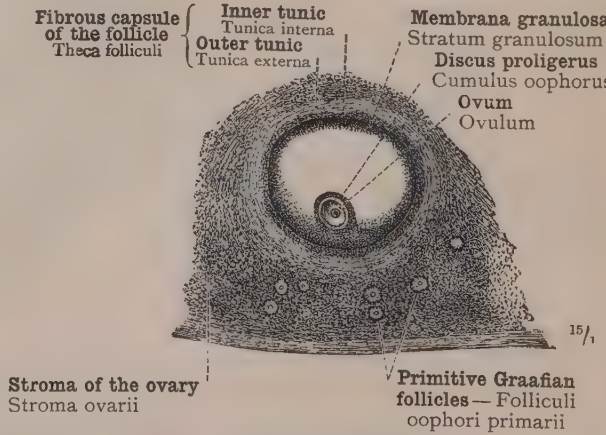


FIG. 879.—GRAAFIAN FOLLICLE, FOLLICULUS OOPHORUS VESICULOSUS, IN SECTION.

[1] The *epoophoron* is also known as the *parovarium*, or *organ of Rosenmüller*.
[2] See Appendix, note 80.
[3] See Appendix, note 81.
[4] See Appendix, note 82.
[5] See Appendix, note 78.
[6] See note 5 to p. 511.
[7] See Appendix, note 67.
[8] See Appendix, note 83.

Uterus—The uterus.—Tuba uterina—The Fallopian tube.—Ovarium—The ovary.

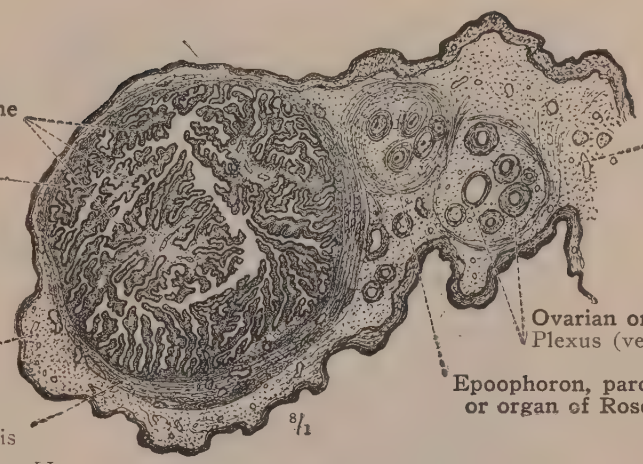
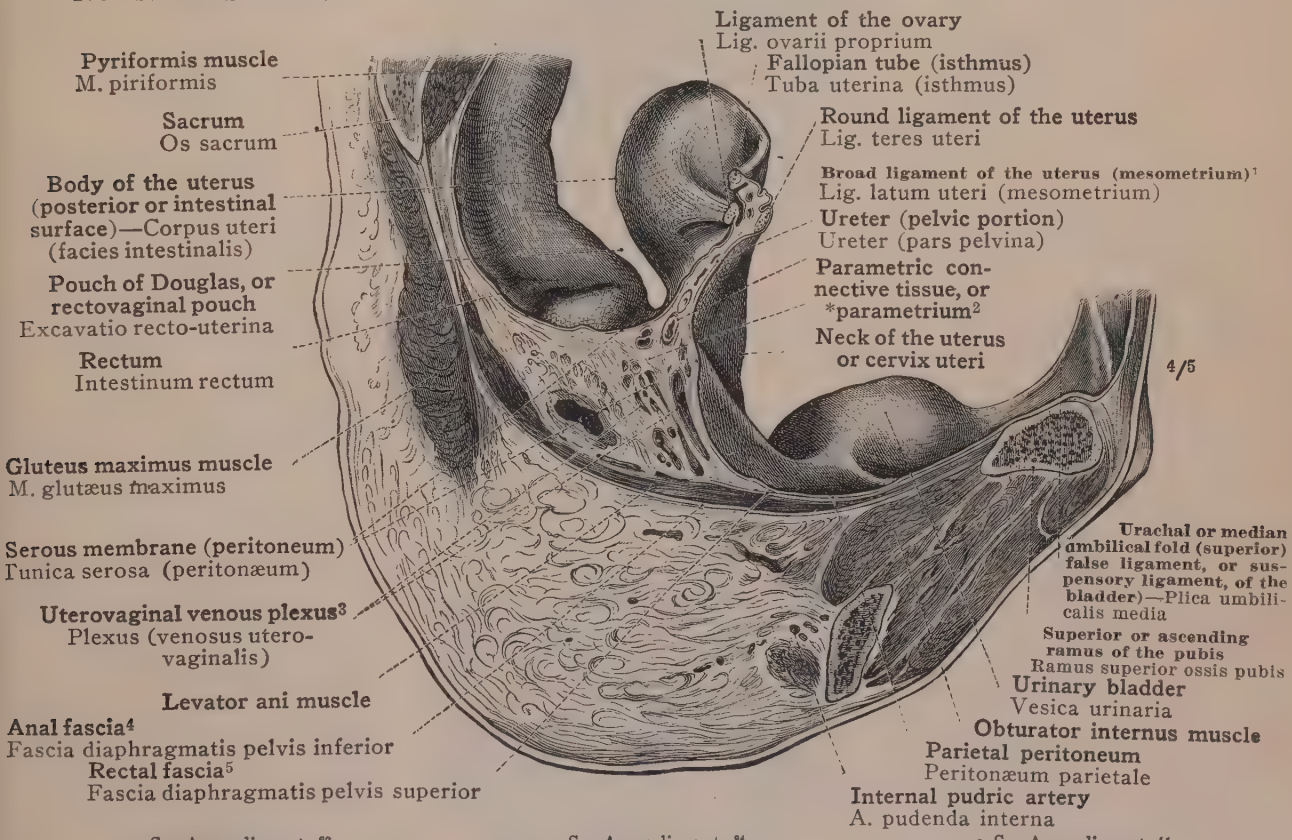


FIG. 880.—AMPULLA TUBÆ UTERINÆ, THE AMPULLA OF THE FALLOPIAN TUBE, WITH THE ADJOINING PORTION OF THE MESOSALPINX, AND THE EPOOPHORON, PAROVARIUM, OR ORGAN OF ROSENMÜLLER, IN TRANSVERSE SECTION.



1 See Appendix, note [82]. 2 See Appendix, note [84]. 3 See Appendix, note [81].
4 See Appendix, note [85]. 5 See Appendix, note [86]. 6 See Appendix, note [87].

FIG. 881.—SAGITTAL SECTION THROUGH THE FEMALE PELVIS, 4 CENTIMETRES (1·576 INCHES) TO THE RIGHT OF THE MEDIAN PLANE. THE SECTION PASSES THROUGH THE RIGHT BROAD LIGAMENT OF THE UTERUS, AND SHOWS THE CONTINUITY OF THE TWO LAYERS OF THIS LIGAMENT WITH THE PARIETAL PERITONEUM OF THE FLOOR OF THE PELVIS. *PARAMETRIUM, OR PARAMETRIC CONNECTIVE TISSUE (*see Appendix, note* [84]). DIAPHRAGMA PELVIS, THE PELVIC DIAPHRAGM (*see Appendix, note* [87]), WITH ITS SUPERIOR AND INFERIOR FASCIAL LAYERS, AND INFERIOR TO THE LATTER OF THESE THE FATTY TISSUE OF THE ISCHIORECTAL FOSSA. FROM A FROZEN PREPARATION.

The long axis of the uterus in this specimen is vertical, the organ being pathologically retroverted.

Tuba uterina—The Fallopian tube.—Ligamentum latum uteri—The broad ligament of the uterus.
***Parametrium—The parametric connective tissue.**

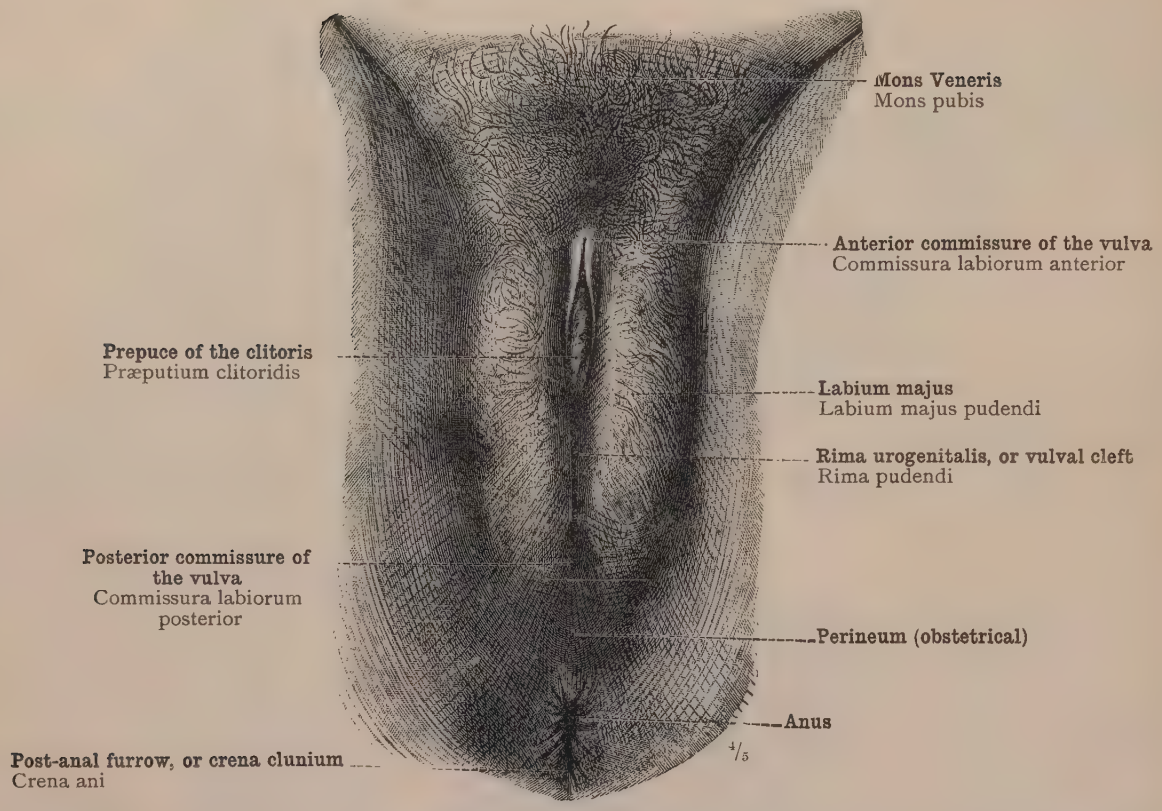
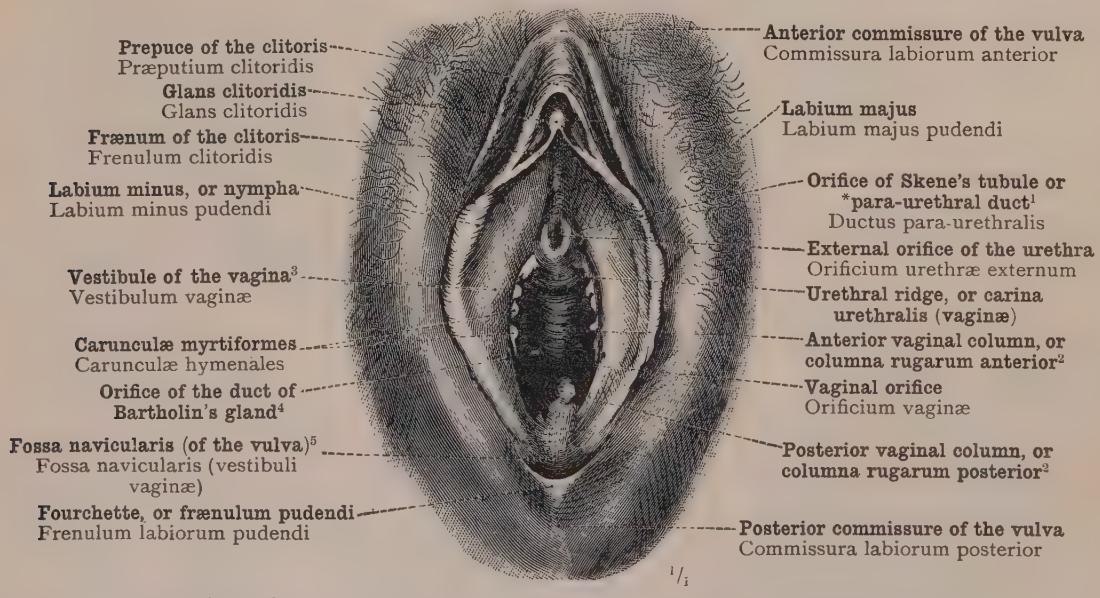


FIG. 882.—PUDENDUM MULIEBRE, THE FEMALE PUDENDUM, OR VULVA, WITH THE LABIA MAJORA. RIMA UROGENITALIS, THE VULVAL CLEFT. FEMALE PERINEUM (OBSTETRICAL PERINEUM). MONS VENERIS, WITH THE PUBIC HAIR.



1 See Appendix, note [88].
2 *Vaginal columns*, anterior and posterior. These may be either single or double.—TR.
3 See Appendix, note 89.
4 *Glandula vestibularis major*, known also as *Duverney's gland* and the *suburethral gland*. (See Appendix, note [66].)
5 See Appendix, note [90].

FIG. 883.—VESTIBULE OF THE VAGINA (*see note* [3] *above*) WITH THE LABIA MINORA OR NYMPHÆ, THE VAGINAL AND URETHRAL ORIFICES, AND THE GLANS CLITORIDIS.

The labia majora have been drawn outwards, and the rima urogenitalis, or vulval cleft, has thus been widely opened.

Partes genitales externæ muliebres—The female external genital organs.

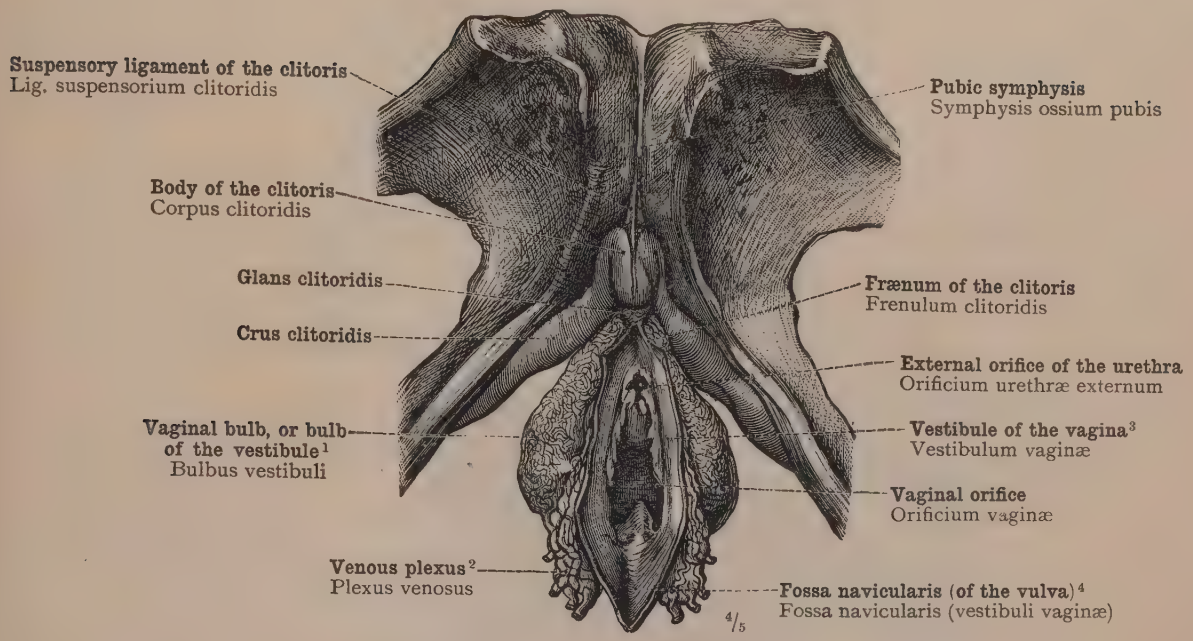


FIG. 884.—THE CLITORIS AND THE VAGINAL BULB OR BULB OF THE VESTIBULE,[1] INJECTED WITH RESIN THROUGH THE VEINS, AND FULLY EXPOSED BY REMOVAL OF THE LABIA MAJORA AND MINORA. SEEN FROM BEFORE AND BELOW.

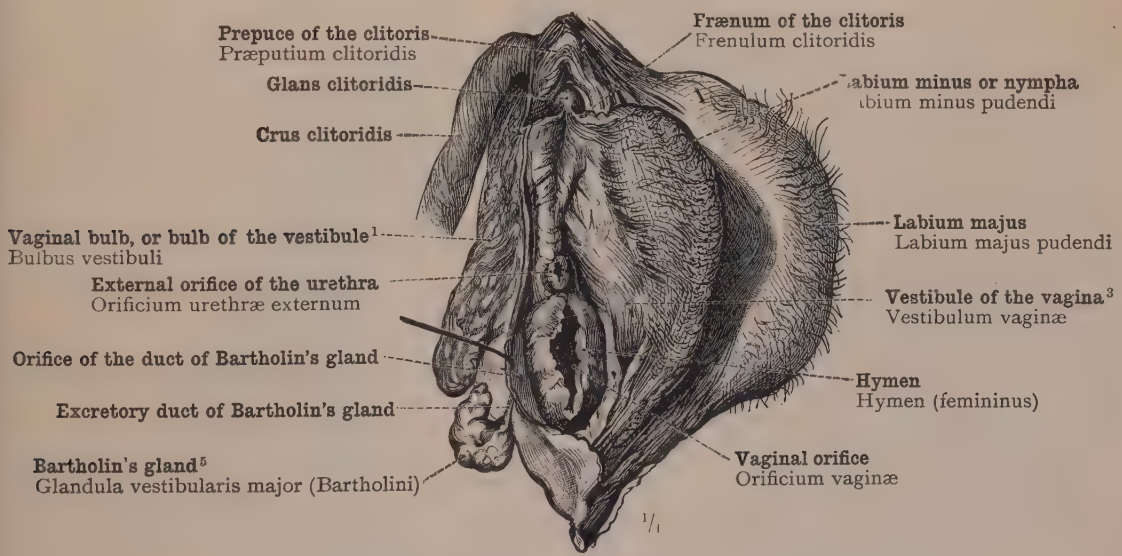
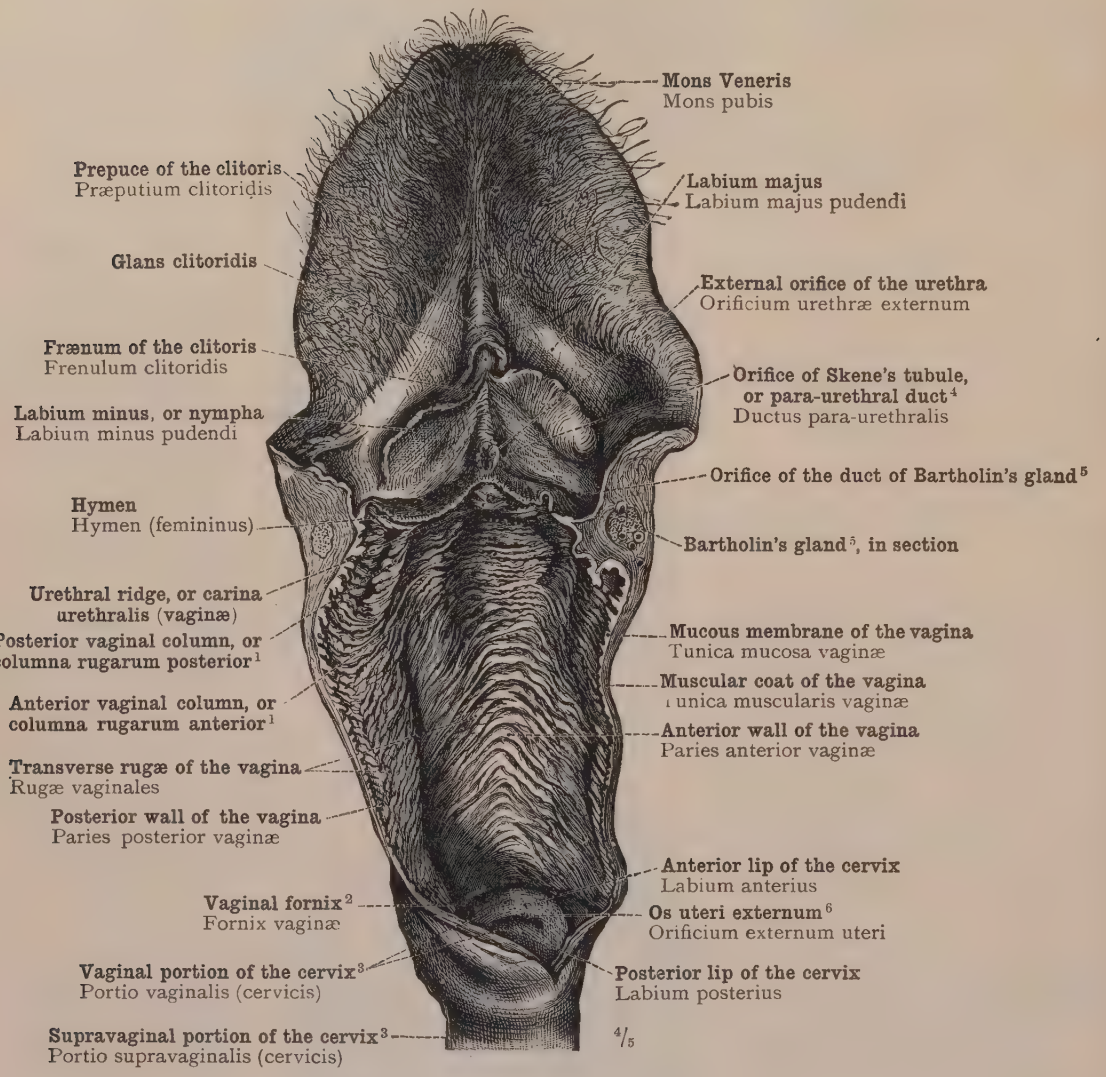


FIG. 885.—FEMALE EXTERNAL GENITAL ORGANS.

The mucous membrane has been removed from the right side of the vestibule[3] and from the vulval area on the right side of the vaginal orifice, and the right labium majus and labium minus have been cut away, to show the relative positions of the crus clitoridis, the vaginal bulb[1] and Bartholin's gland.[5] On the left side the labium majus and labium minus have been drawn outwards.

1 See Appendix, note 91. 2 See Appendix, note 92. 3 See Appendix, note 89. 4 See Appendix, note 90.
5 Known also as *Duverney's gland* or the *suburethral gland*. (See Appendix, note 62.)

Partes genitales externæ—The female external genital organs.



1 See [2] to p. 514. 2 See Appendix, note 78. 3 See Appendix, note 75. 4 See Appendix, note 88.
5 *Glandula vestibularis major*, known also as *Duverney's gland* and the *suburethral gland.* (See Appendix, note 65.)
6 See Appendix, note 67.

FIG. 886.—FEMALE EXTERNAL GENITAL ORGANS OF A VIRGIN, ATTACHED TO THE VAGINA, WHICH HAS BEEN ISOLATED AND OPENED, AND A PORTION OF THE CERVIX UTERI. HYMEN (FEMININUS). THE VAGINAL FORNIX (*see Appendix, note* 78), WITH THE ANTERIOR AND POSTERIOR LIPS OF THE CERVIX, AND THE OS UTERI EXTERNUM (*see Appendix, note* 67). THE VAGINAL COLUMNS, COLUMNÆ RUGARUM, AND THE TRANSVERSE RUGÆ OF THE VAGINA, RUGÆ VAGINALES.

The posterior wall of the vagina has been divided longitudinally throughout to the left of the median line, and has been turned to the right. Near the vestibule (*see Appendix, note* 89) the section passes through the left Bartholin's gland (*see note* 5 *above*).

The Vagina.

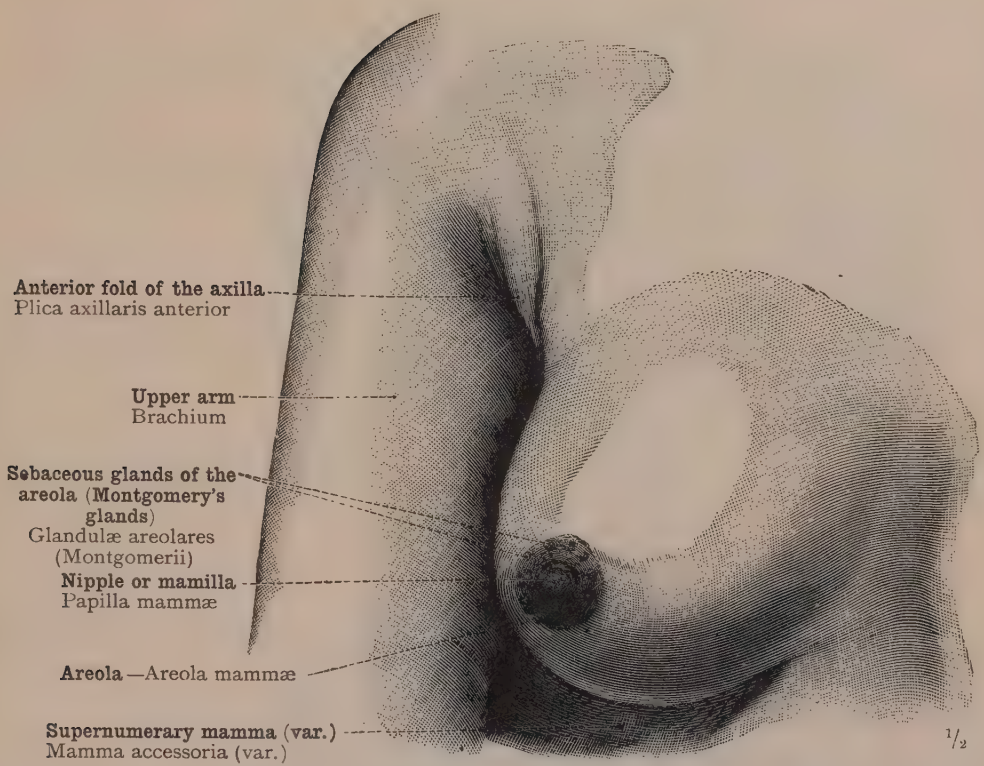


FIG. 887.—MAMMA, THE BREAST, OF A VIRGIN AGED EIGHTEEN YEARS.

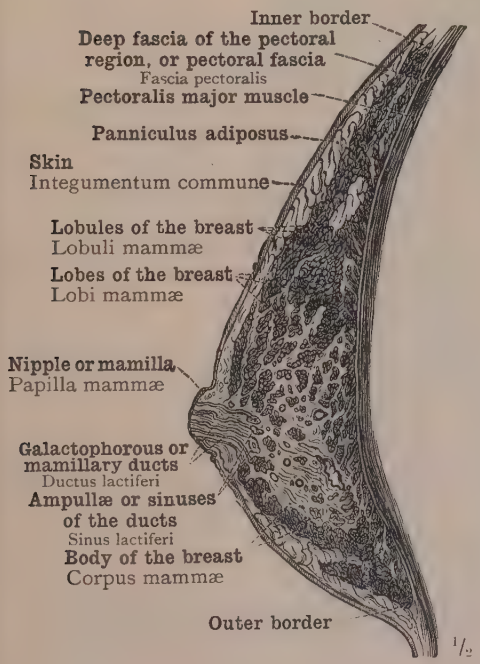


FIG. 888.—HORIZONTAL SECTION THROUGH THE FEMALE BREAST.

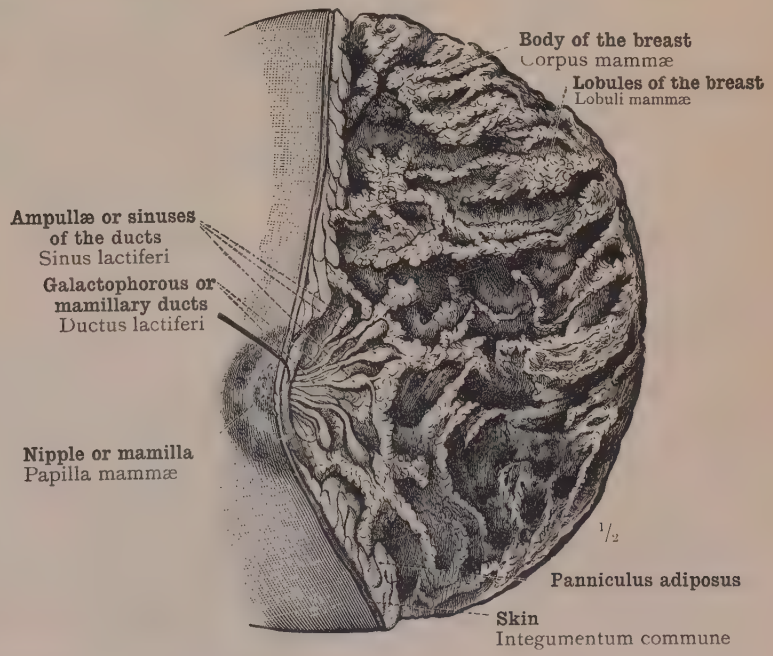


FIG. 889.—BREAST OF A NURSING MOTHER, HARDENED IN STRONG ALCOHOL; FROM ONE HALF OF THE ORGAN THE SKIN AND SUBCUTANEOUS FATTY TISSUE HAVE BEEN REMOVED, AND THE GALACTOPHOROUS OR MAMILLARY DUCTS WITH THEIR SINUSES HAVE BEEN LAID BARE.

Mamma—The breast.

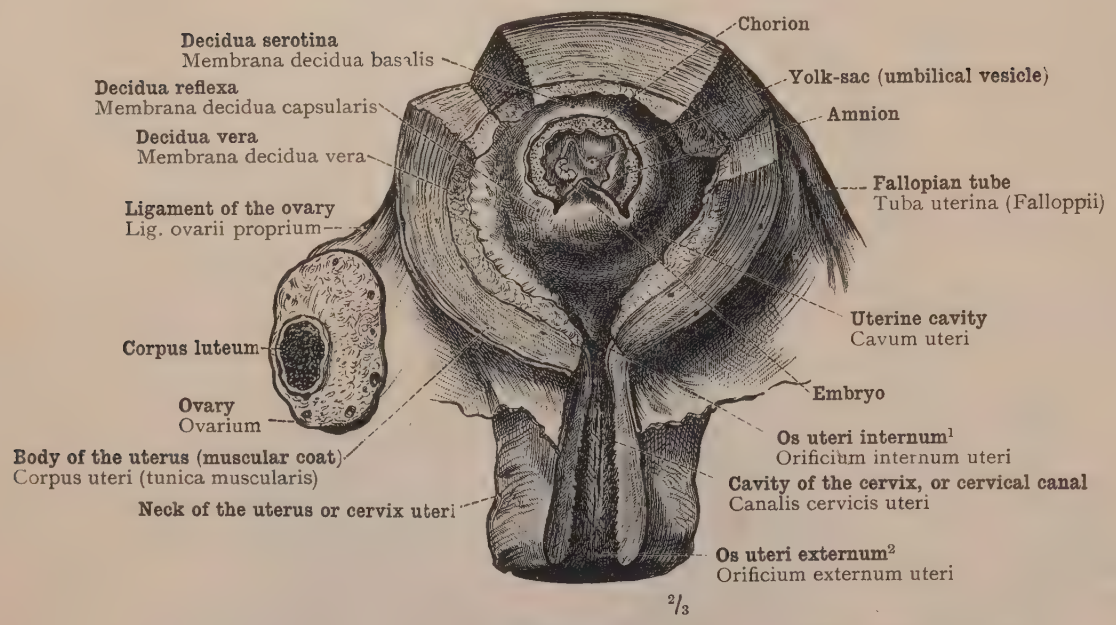


FIG. 890.—UTERUS IN THE FIFTH WEEK OF PREGNANCY, OPENED FROM BEHIND.

By the removal of parts of the membranes the cavity of the amnion has been opened.

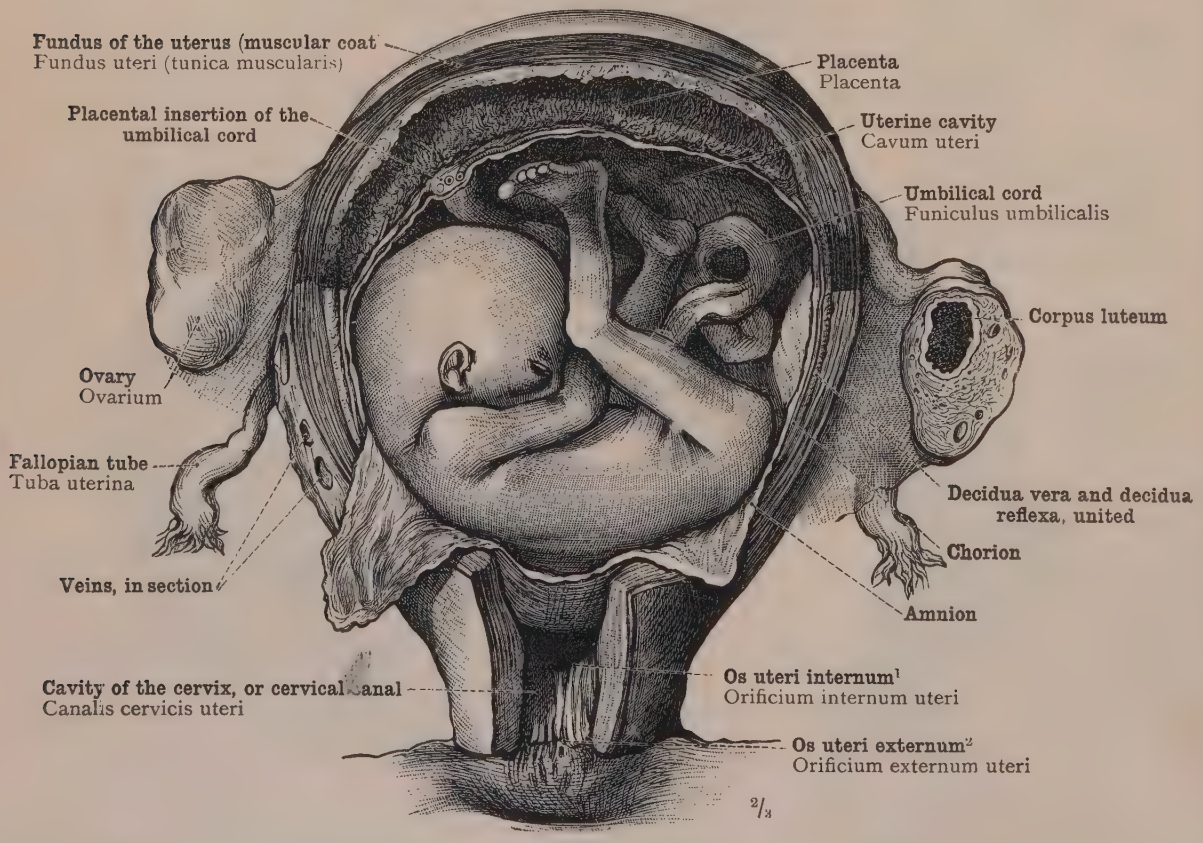


FIG. 891.—UTERUS IN THE SIXTH MONTH OF PREGNANCY (MONTHS OF FOUR WEEKS EACH), OPENED BY THE REMOVAL OF THE POSTERIOR WALL. THE FŒTUS, WITH ITS MEMBRANES, AND THE PLACENTA, IN TRANSVERSE SECTION.

[1] See note 5 to p. 511. [2] See Appendix, note 67.

Uterus gravidus—The gravid uterus.

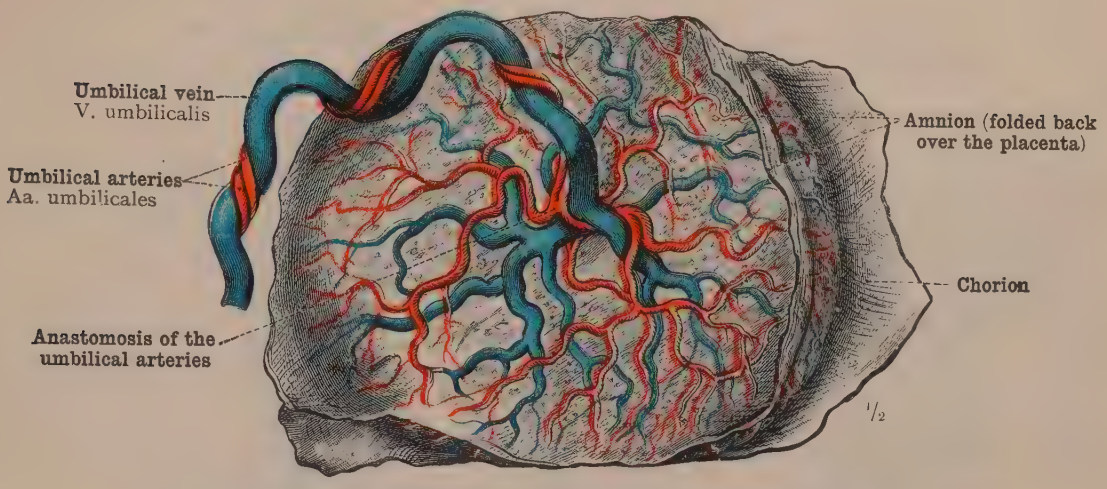
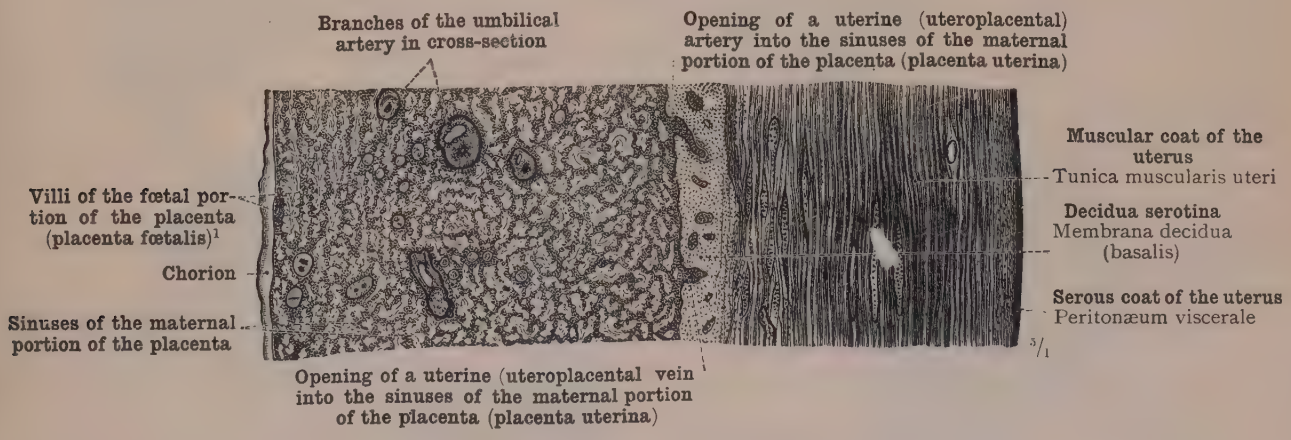


FIG. 892.—INTERNAL OR FŒTAL SURFACE OF THE PLACENTA AT FULL TERM.
The umbilical vessels have been injected.

FIG. 893.—EXTERNAL, MATERNAL, OR UTERINE SURFACE OF THE PLACENTA AT FULL TERM, WITH THE UMBILICAL CORD (FUNICULUS UMBILICALIS).


Branches of the umbilical artery in cross-section
Opening of a uterine (uteroplacental) artery into the sinuses of the maternal portion of the placenta (placenta uterina)
Villi of the fœtal portion of the placenta (placenta fœtalis)[1]
Chorion
Sinuses of the maternal portion of the placenta
Muscular coat of the uterus
Tunica muscularis uteri
Decidua serotina
Membrana decidua (basalis)
Serous coat of the uterus
Peritonæum viscerale
Opening of a uterine (uteroplacental vein into the sinuses of the maternal portion of the placenta (placenta uterina)
5/1

[1] These villi are known indifferently as *fœtal villi* and *chorioni. villi.*

FIG. 894.—UTERUS AND PLACENTA IN TRANSVERSE SECTION. SIXTH MONTH OF PREGNANCY (MONTHS OF FOUR WEEKS EACH).

The Placenta.

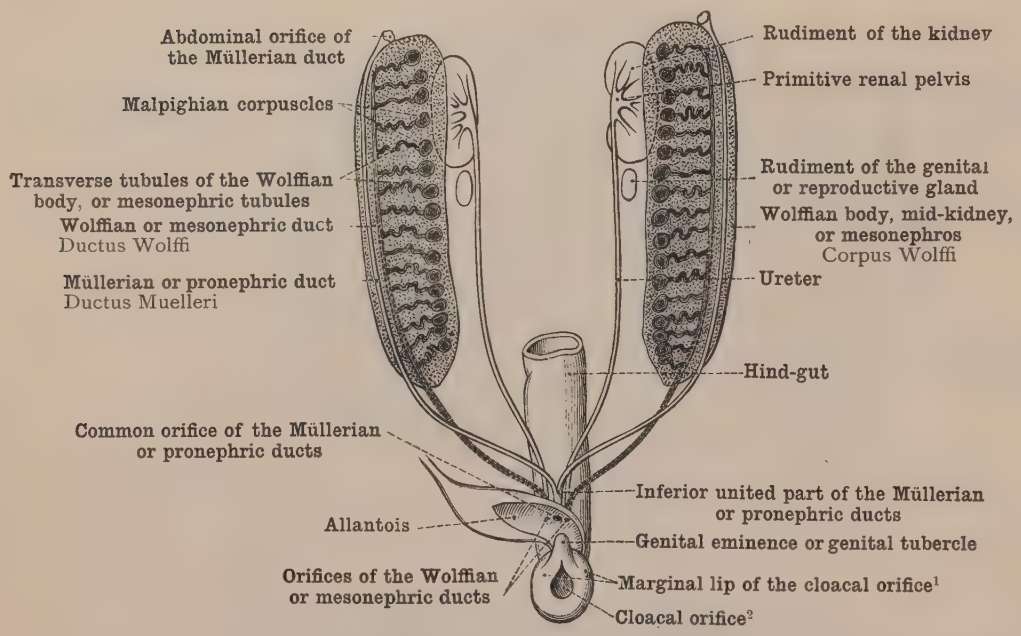

Abdominal orifice of the Müllerian duct
Malpighian corpuscles
Transverse tubules of the Wolffian body, or mesonephric tubules
Wolffian or mesonephric duct
Ductus Wolffi
Müllerian or pronephric duct
Ductus Muelleri
Common orifice of the Müllerian or pronephric ducts
Allantois
Orifices of the Wolffian or mesonephric ducts
Rudiment of the kidney
Primitive renal pelvis
Rudiment of the genital or reproductive gland
Wolffian body, mid-kidney, or mesonephros
Corpus Wolffi
Ureter
Hind-gut
Inferior united part of the Müllerian or pronephric ducts
Genital eminence or genital tubercle
Marginal lip of the cloacal orifice[1]
Cloacal orifice[2]

FIG. 895.—DIAGRAMMATIC REPRESENTATION OF THE PRIMITIVE UROGENITAL ORGANS OF THE EMBRYO PRIOR TO SEXUAL DIFFERENTIATION. THE WOLFFIAN BODY (MID-KIDNEY OR MESONEPHROS) WITH THE WOLFFIAN (MESONEPHRIC) AND MÜLLERIAN (PRONEPHRIC) DUCTS.

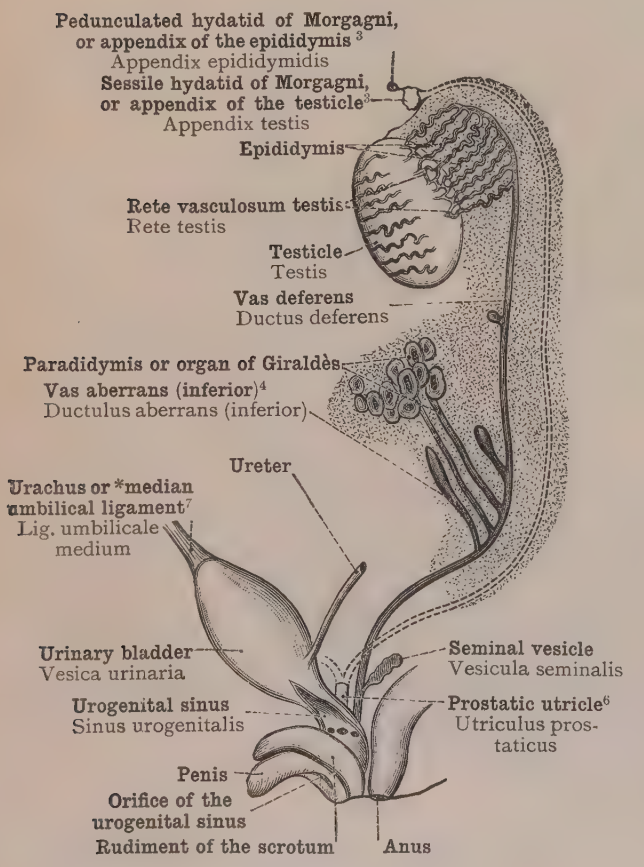


FIG. 896.—DEVELOPMENT OF THE MALE GENITO-URINARY APPARATUS.

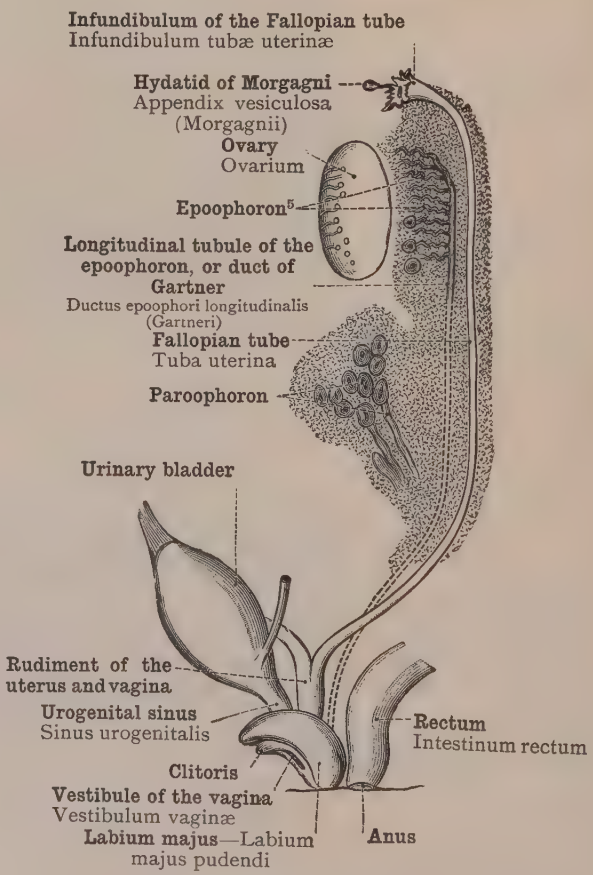


FIG. 897.—DEVELOPMENT OF THE FEMALE GENITO-URINARY APPARATUS.

[1] See Appendix, note 93. [2] See Appendix, note 94. [3] See Appendix, note 69.
[4] See Appendix, note 71. [5] Known also as the *parovarium*, or *organ of Rosenmüller*.
[6] Known also as the *prostatic vesicle*, *prostatic sinus*, *sinus pocularis*, and *uterus masculinus*. [7] See note 3 to p. 387, Part III.

Diagram showing the Development from a Common Type of the Male and the Female Genito-Urinary Apparatus.

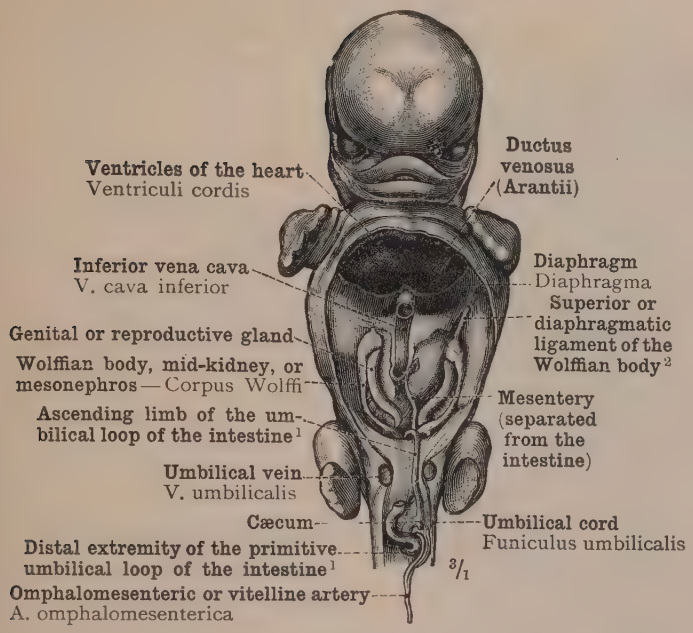


FIG. 898.—HUMAN FŒTUS AT THE END OF THE SIXTH WEEK. THE GENITAL OR REPRODUCTIVE GLANDS AND THE WOLFFIAN BODIES ARE LAID BARE BY THE REMOVAL OF THE LIVER, THE STOMACH, AND THE DESCENDING LIMB OF THE UMBILICAL LOOP OF THE INTESTINE.[1]

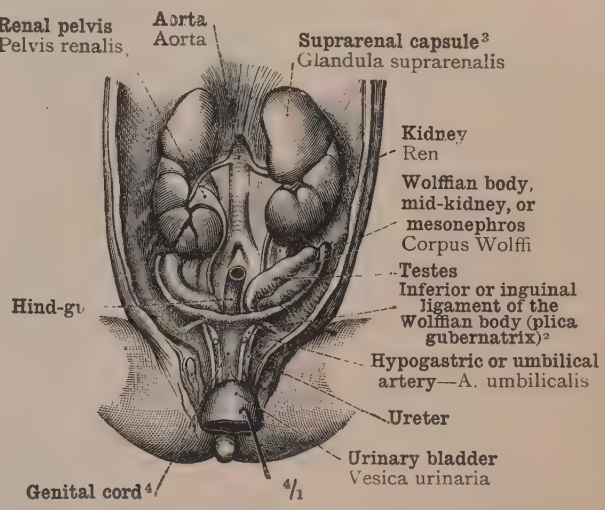


FIG. 899.—GENITO-URINARY ORGANS OF A MALE FŒTUS AT THE END OF THE TENTH WEEK.

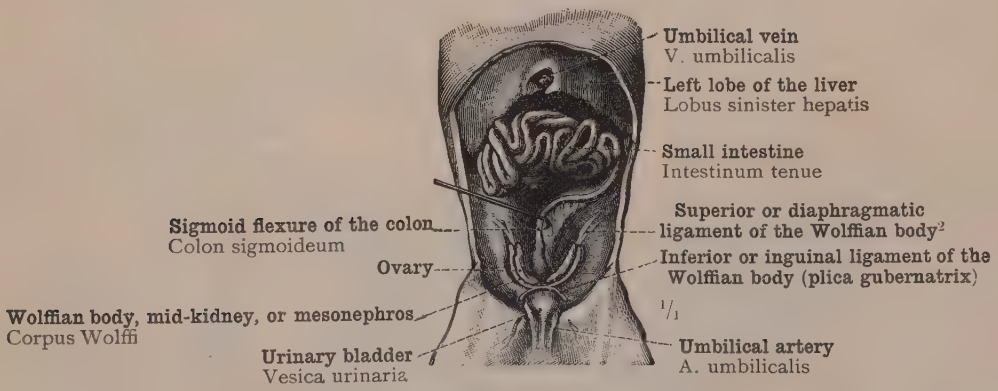


FIG. 900.—ABDOMINAL ORGANS OF A FEMALE FŒTUS IN THE MIDDLE OF THE FOURTH MONTH (MONTHS OF FOUR WEEKS EACH).

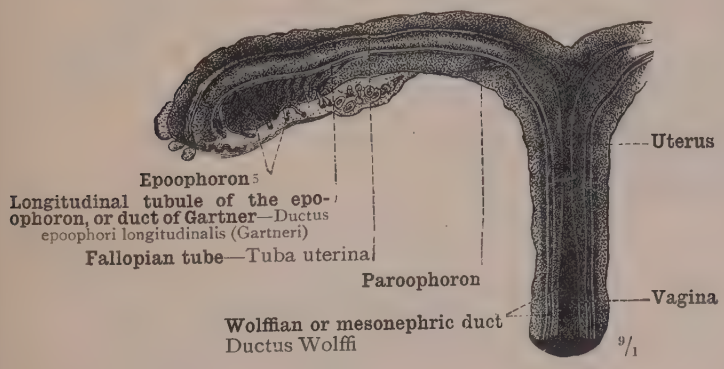


FIG. 901.—UTERUS AND FALLOPIAN TUBE OF A THREE AND A HALF MONTHS FŒTUS (MONTHS OF FOUR WEEKS EACH), WITH THE WOLFFIAN DUCT.

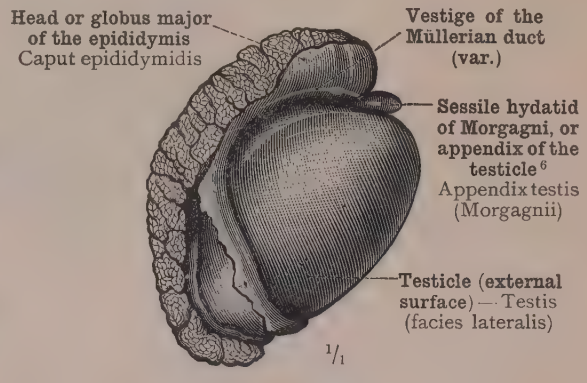

Head or globus major of the epididymis
Caput epididymidis
Vestige of the Müllerian duct (var.)
Sessile hydatid of Morgagni, or appendix of the testicle[6]
Appendix testis (Morgagnii)
Testicle (external surface)—Testis (facies lateralis)
1/1

FIG. 902.—TESTICLE OF AN ADULT EXHIBITING A VESTIGE OF THE MÜLLERIAN DUCT.

[1] See note [1] to p. 451.
[2] See Appendix, note 95.
[3] Called also *suprarenal body*, or *adrenal*.
[4] See Appendix, note 96
[5] Known also as the *parovarium* or organ of Rosenmüller.
[6] See Appendix, note 69.

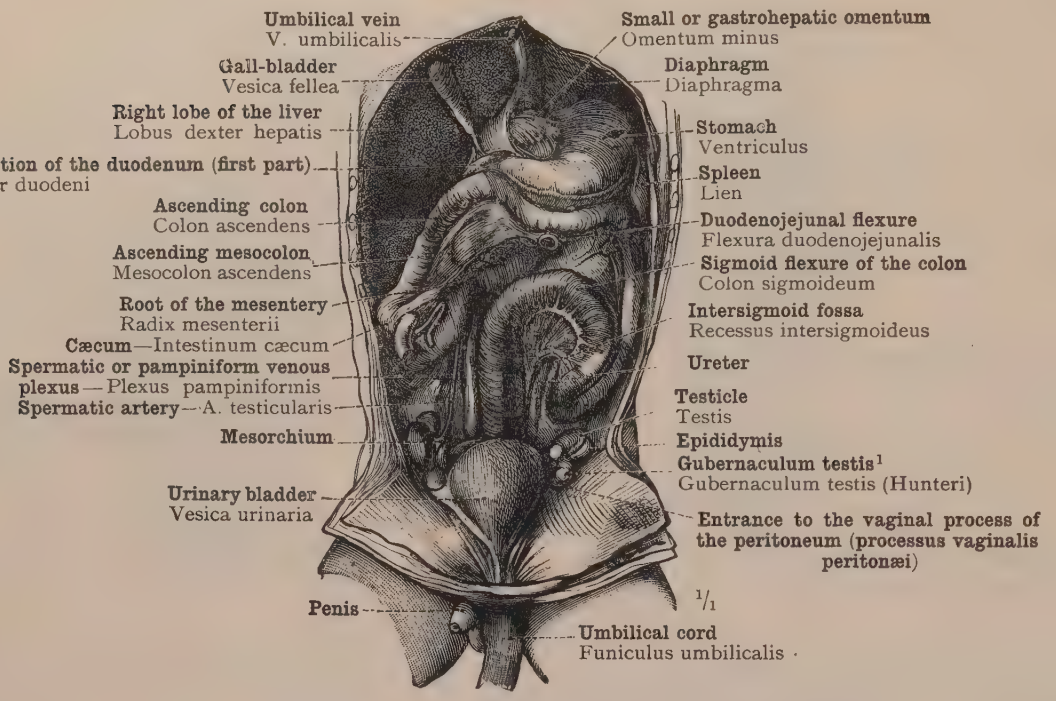


FIG. 903.—ABDOMINAL VISCERA OF A FŒTUS AT THE END OF THE SIXTH MONTH (MONTHS OF FOUR WEEKS EACH), HAVING A BODY-LENGTH OF 28 CENTIMETRES (11 INCHES).

The small intestine has been cut away, and the liver drawn upwards as far as possible. The testicle and the epididymis are in the inguinal region.

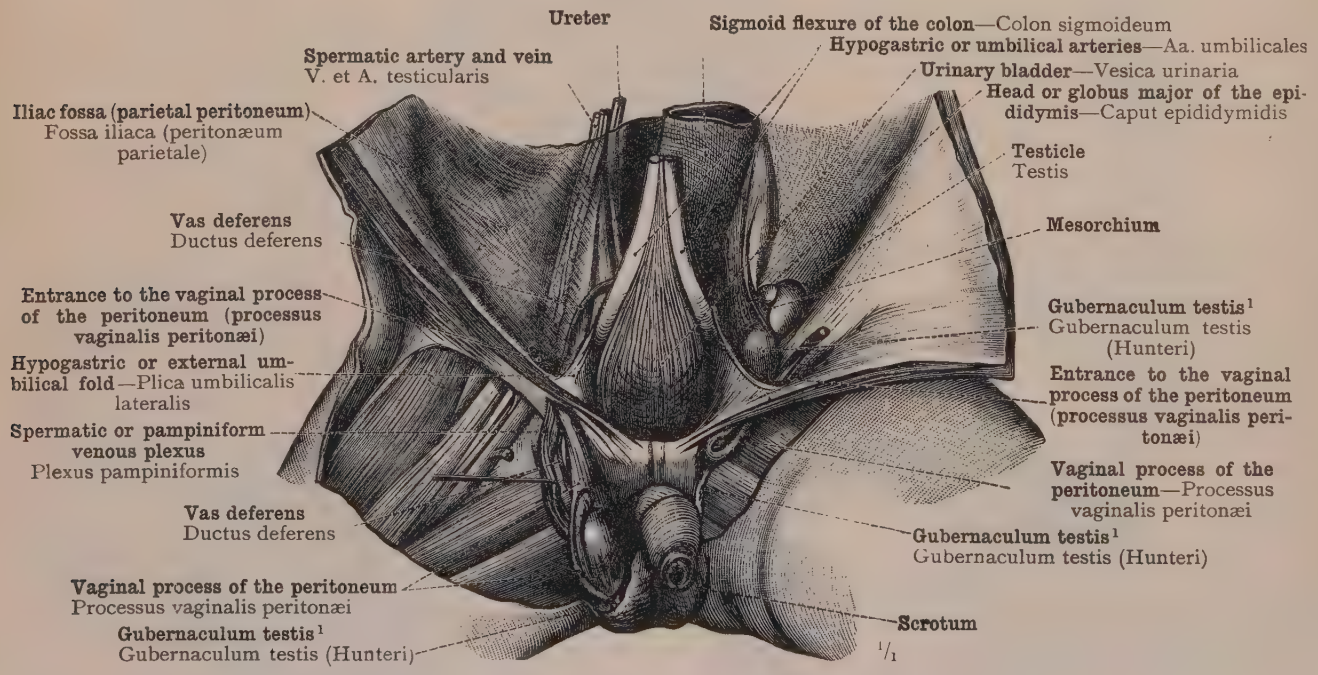


FIG. 904.—PELVIC REGION OF A FŒTUS IN THE MIDDLE OF THE NINTH MONTH (MONTHS OF FOUR WEEKS EACH), HAVING A BODY-LENGTH OF 42 CENTIMETRES (16½ INCHES).

The anterior abdominal wall has been opened. The right testicle has already descended into the scrotum, whilst the left is still above the entrance to the inguinal canal. On the right side the spermatic or pampiniform venous plexus, which lies behind the vaginal process of the peritoneum, has been separated from this latter and drawn outwards.

[1] See Appendix, note 95.

Descensus testis—Descent of the testicles.

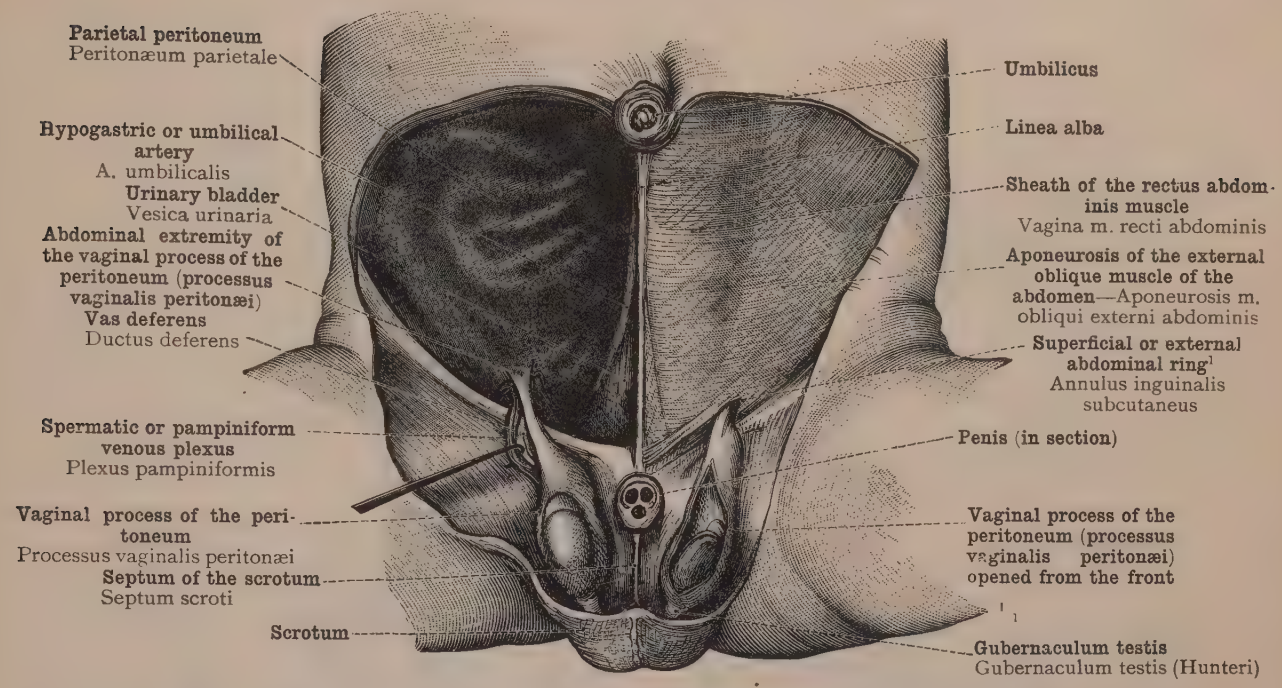


FIG. 905.—ABDOMINAL AND PELVIC REGIONS OF A FŒTUS IN THE MIDDLE OF THE TENTH MONTH (MONTHS OF FOUR WEEKS EACH), HAVING A BODY-LENGTH OF 47 CENTIMETRES (18½ INCHES).

Both testicles are in the scrotum; the vaginal process of the peritoneum, processus vaginalis peritonæi, still communicates freely with the abdominal cavity. On the right side of the body, all the layers of the abdominal wall except the parietal peritoneum have been removed; on the left side of the body, the sheath of the rectus abdominis muscle and the aponeurosis of the external oblique muscle of the abdomen with the superficial or external abdominal ring (external inguinal aperture) are displayed. The left vaginal process of the peritoneum has been opened by an incision through its anterior wall.

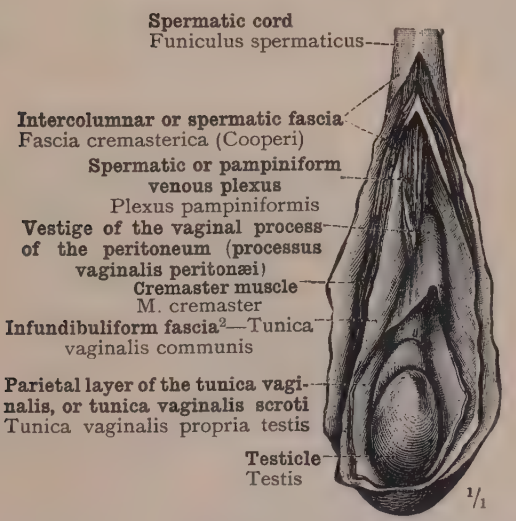


FIG. 906.—THE SPERMATIC CORD OF A BOY AGED TWO MONTHS.

The coverings of the cord and the testicle have been divided to expose these structures. A serous pouch, the vestige of the vaginal process of the peritoneum (processus vaginalis peritonæi), runs up along the cord for more than half an inch.

[1] Or *external inguinal aperture.*

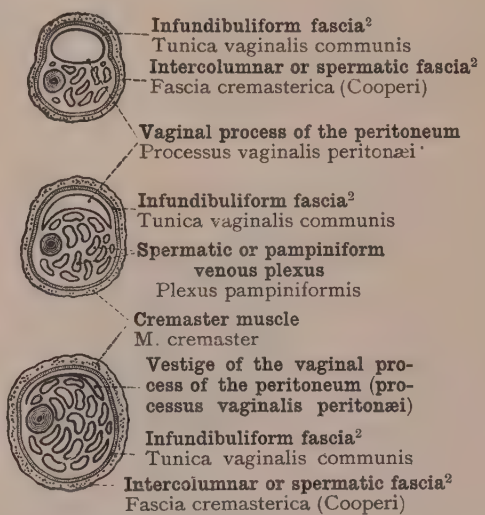


FIG. 907.—DIAGRAMMATIC SECTIONS OF THE SPERMATIC CORD SHOWING THE CLOSURE OF THE VAGINAL PROCESS OF THE PERITONEUM (PROCESSUS VAGINALIS PERITONÆI).

[2] See Appendix, note [68].

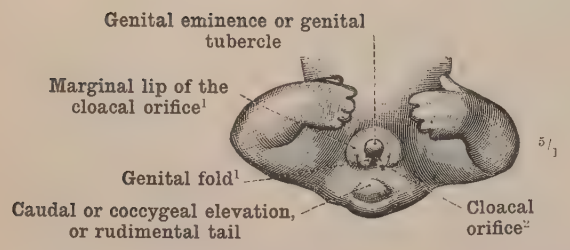


FIG. 908.—EXTERNAL GENITAL ORGANS OF A FŒTUS IN THE SEVENTH WEEK.

The urinary and genital canals unite distally with the alimentary canal to form a common cavity, the cloaca,[2] by which they communicate with the exterior.

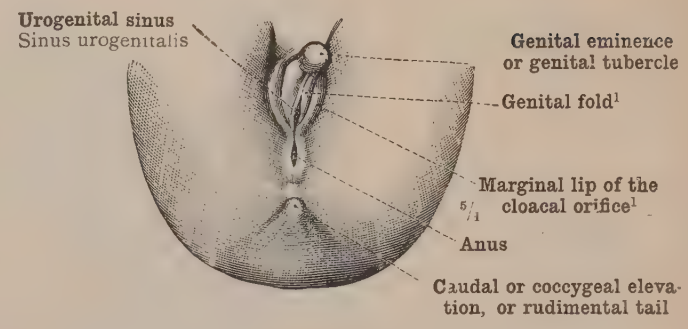


FIG. 909.—EXTERNAL GENITAL ORGANS OF A HUMAN FŒTUS IN THE BEGINNING OF THE THIRD MONTH (MONTHS OF FOUR WEEKS EACH), HAVING A BODY-LENGTH OF 4·5 CENTIMETRES (1¾ INCHES).

The division of the cloaca into a dorsal or anal and a ventral or urogenital part (urogenital sinus) has begun.

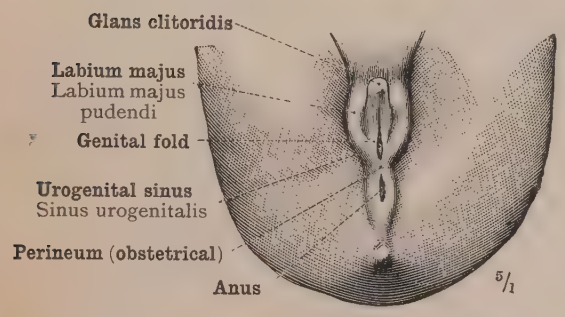


FIG. 910.—EXTERNAL GENITAL ORGANS OF A FEMALE FŒTUS IN THE MIDDLE OF THE THIRD MONTH (MONTHS OF FOUR WEEKS EACH), HAVING A BODY-LENGTH OF 5·6 CENTIMETRES (2⅕ INCHES).

The separation of the anus from the urogenital sinus is completed.

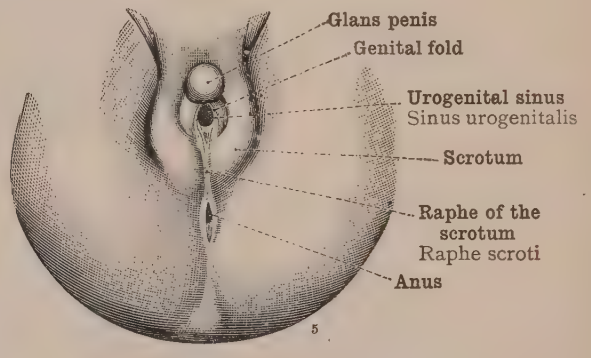


FIG. 911.—EXTERNAL GENITAL ORGANS OF A MALE FŒTUS IN THE BEGINNING OF THE FOURTH MONTH (MONTHS OF FOUR WEEKS EACH), HAVING A BODY-LENGTH OF 8·1 CENTIMETRES (3⅕ INCHES). UNION OF THE GENITAL FOLDS TO FORM THE URETHRA.[1]

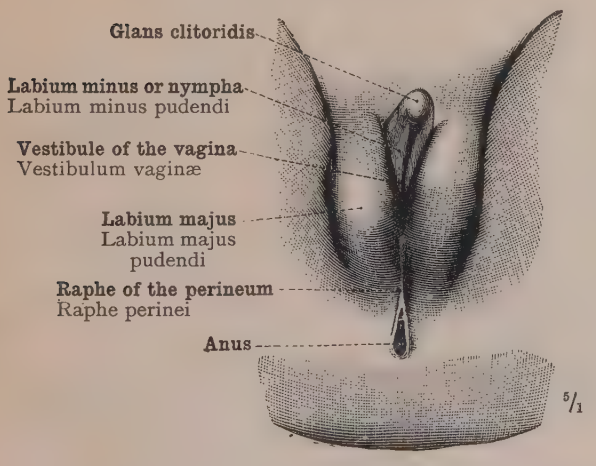


FIG. 912.—EXTERNAL GENITAL ORGANS OF A FEMALE FŒTUS AT THE END OF THE FIFTH MONTH (MONTHS OF FOUR WEEKS EACH), HAVING A BODY-LENGTH OF 11·5 CENTIMETRES (4½ INCHES).

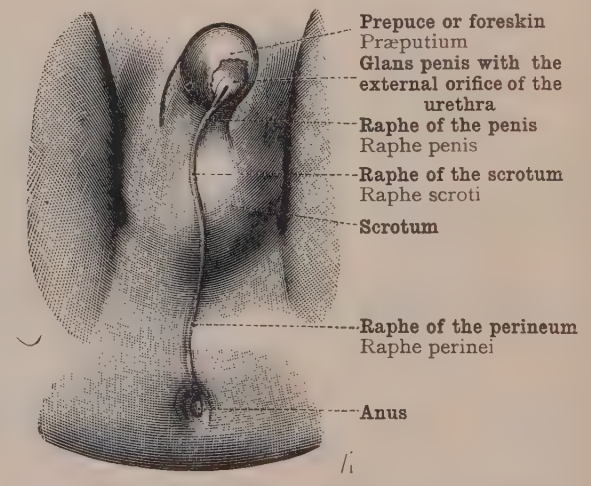


FIG. 913.—EXTERNAL GENITAL ORGANS OF A MALE FŒTUS AT THE END OF THE FIFTH MONTH (MONTHS OF FOUR WEEKS EACH), HAVING A BODY-LENGTH OF 12 CENTIMETRES (4¾ INCHES).

[1] See Appendix, note 93.

[2] See Appendix, note 94.

The Development of the External Genital Organs.

THE MUSCLES OF THE PERINEUM

AND

THE TOPOGRAPHICAL ANATOMY OF THE PELVIC VISCERA

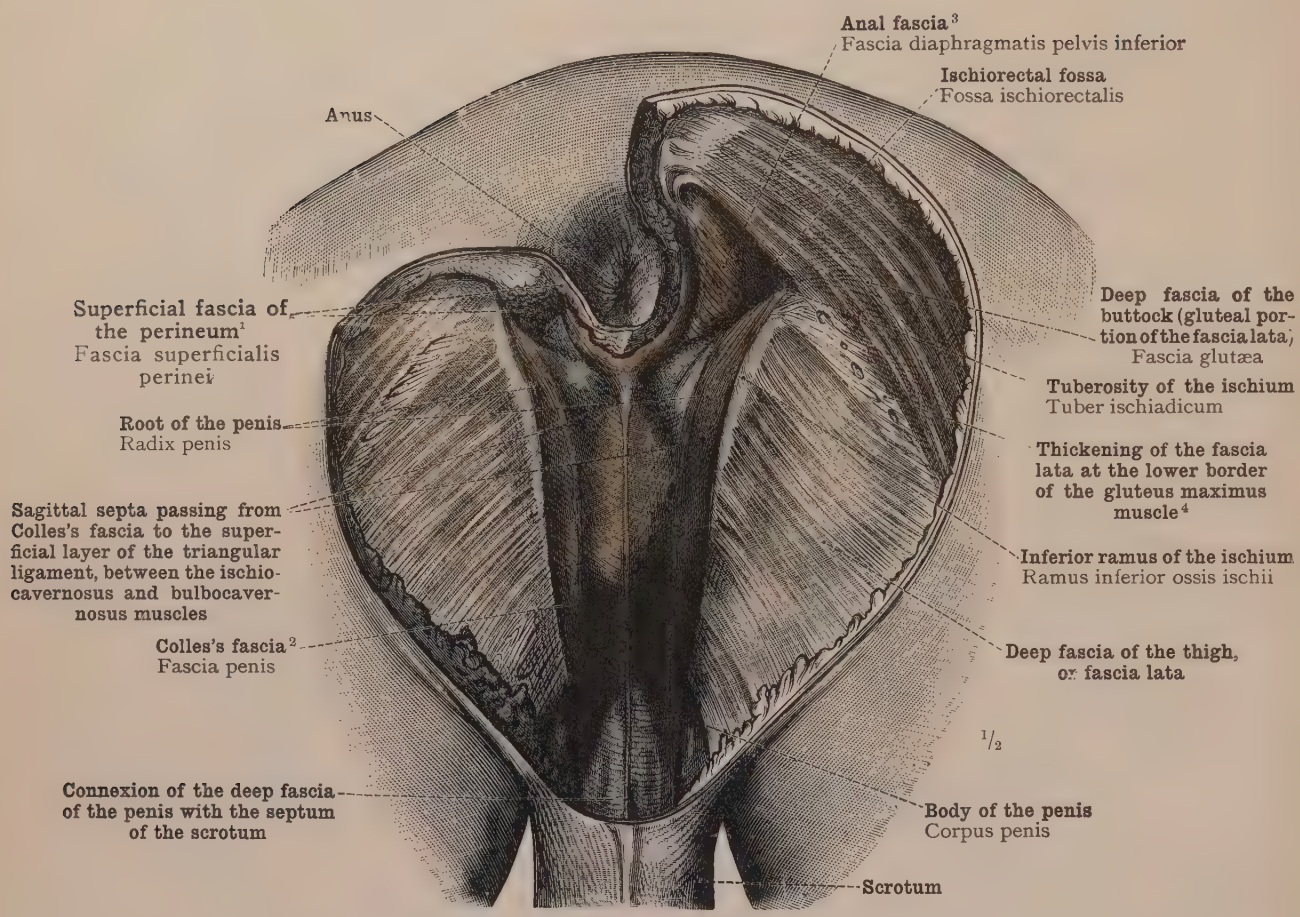

Anal fascia[3]
Fascia diaphragmatis pelvis inferior
Ischiorectal fossa
Fossa ischiorectalis
Anus
Superficial fascia of the perineum[1]
Fascia superficialis perinei
Deep fascia of the buttock (gluteal portion of the fascia lata)
Fascia glutæa
Tuberosity of the ischium
Tuber ischiadicum
Root of the penis
Radix penis
Thickening of the fascia lata at the lower border of the gluteus maximus muscle[4]
Sagittal septa passing from Colles's fascia to the superficial layer of the triangular ligament, between the ischiocavernosus and bulbocavernosus muscles
Inferior ramus of the ischium
Ramus inferior ossis ischii
Colles's fascia[2]
Fascia penis
Deep fascia of the thigh, or fascia lata
1/2
Connexion of the deep fascia of the penis with the septum of the scrotum
Body of the penis
Corpus penis
Scrotum

FIG. 914.—THE SUPERFICIAL LAYERS OF THE PERINEAL REGION OF THE MALE.

On the right side of the body, the skin and the superficial fascia[1] having been removed as far back as the posterior limit of the perineal region, the fat has been cleared out of the ischiorectal fossa, and the anal fascia covering the inferior surface of the levator ani muscle (fascia diaphragmatis pelvis inferior—*see Appendix, notes* 85 *and* 106) has been laid bare. On the left side of the body, in the posterior part of the perineal region, the skin and the superficial fascia have not been entirely removed, and the fat occupying the ischiorectal fossa has been left undisturbed.

THE POSTERIOR PART OF THE DEEP FASCIA OF THE PENIS, OR COLLES'S FASCIA,[2] AND ITS CONNEXIONS WITH THE PERIMYSIUM OF THE EXTERNAL OR SUPERFICIAL SPHINCTER OF THE ANUS AND WITH THE SEPTUM OF THE SCROTUM. THE PARTS OF THE DEEP FASCIA OF THE THIGH (FASCIA LATA) ADJOINING THE PERINEUM, INCLUDING THE LOWER PART OF THE DEEP FASCIA OF THE BUTTOCK OR GLUTEAL PORTION OF THE FASCIA LATA.[4]

[1] Sometimes distinguished in England as the *superficial layer* of the superficial fascia, *Colles's fascia* being then called the *deep layer* of the same. The former is, however, the true superficial fascia, and is continuous with the dartos layer of the scrotum.—TR.

[2] *Colles's Fascia.*—This is the posterior part of what is called by the author *fascia penis* (*see note* [1] *to p.* 508). Though in fact continuous with the deep fascia of the penis and scrotum, this fascia is in the anterior half of the perineal region (for it does not extend into the posterior half of that region), always distinguished by English anatomists by a separate name. It is usually, and most suitably, known as *Colles's fascia*, but is sometimes called the *deep layer of the superficial fascia* (*see note* [1] *above*), and sometimes the *deep perineal fascia*. The last name should be avoided, since it is liable to cause confusion, having been applied also to the triangular ligament of the urethra.—TR.

[3] See Appendix, note 85.

[4] *The deep fascia of the buttock or gluteal portion of the fascia lata* (the *fascia glutæa* of the author) is thick and white where it overlies the gluteus medius in front of the gluteus maximus muscle, representing here an obsolete anterior portion of the latter muscle. At the upper border of the gluteus maximus, it divides into two thin layers to enclose that muscle; and when these reunite at the lower border there is again a thickening, a dense band of transverse fibres being formed. This is perforated a little external to the tuberosity of the ischium, by the inferior or long pudendal branch of the small sciatic nerve; and further out, by the ascending or recurrent gluteal cutaneous branches of the same nerve.—TR.

Regio perinealis—The perineal region.

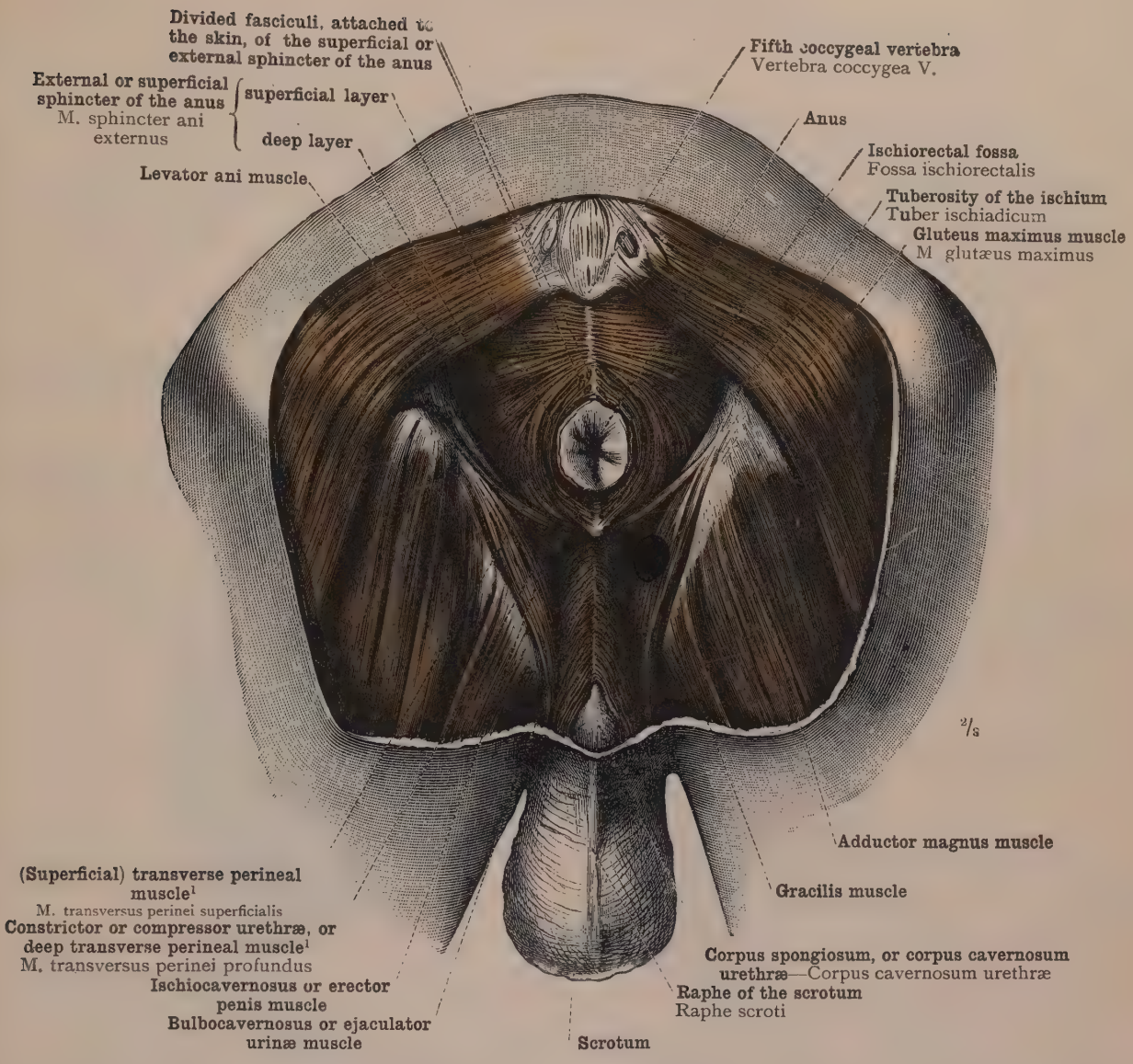


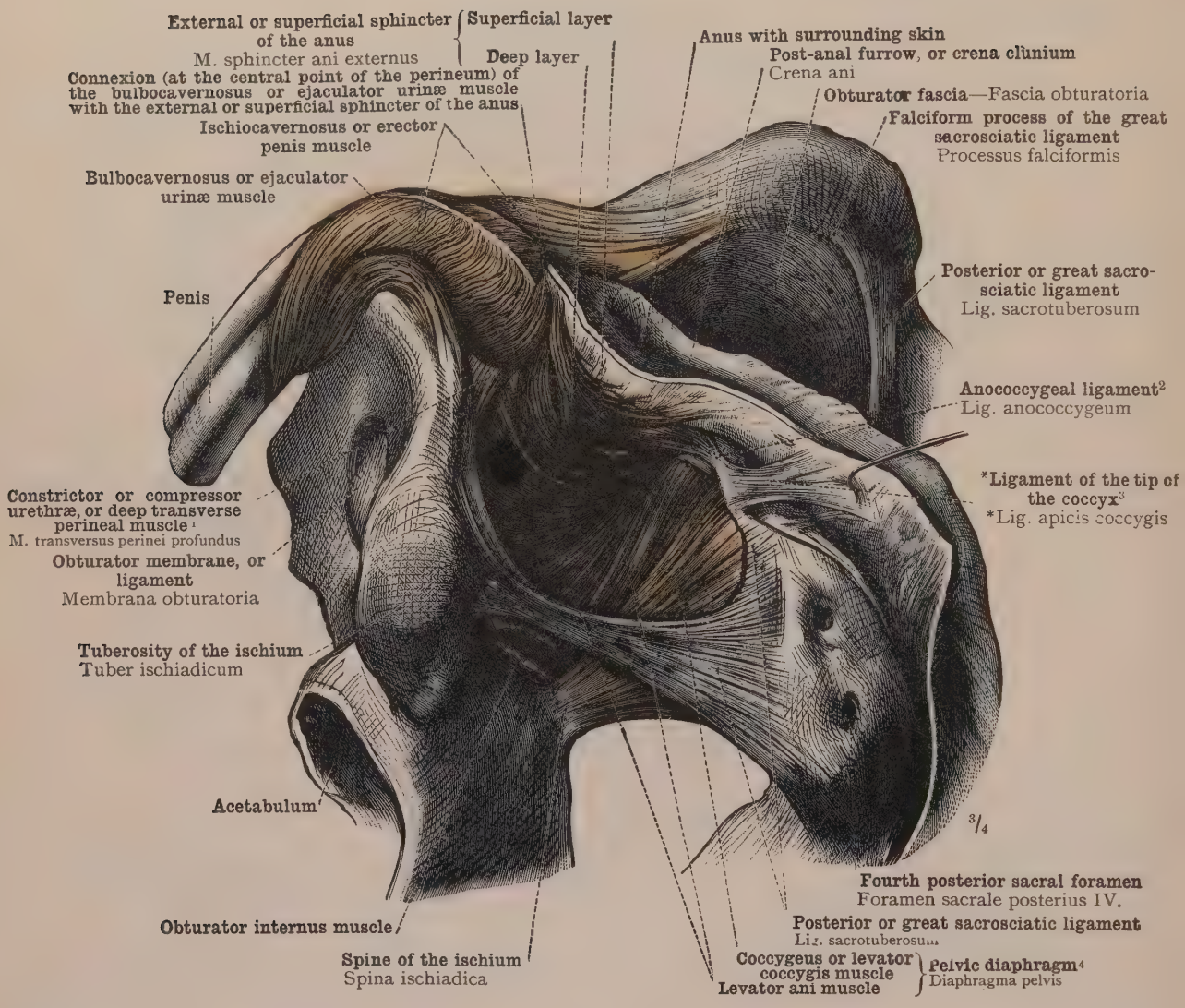
FIG. 915.—THE MUSCLES OF THE PERINEAL REGION OF THE MALE SEEN FROM BELOW AND BEHIND: LEVATOR ANI MUSCLE; MUSCULUS SPHINCTER ANI EXTERNUS, THE EXTERNAL OR SUPERFICIAL SPHINCTER OF THE ANUS; BULBOCAVERNOSUS OR EJACULATOR URINÆ MUSCLE; ISCHIOCAVERNOSUS OR ERECTOR PENIS MUSCLE; MUSCULUS TRANSVERSUS PERINEI SUPERFICIALIS, THE (SUPERFICIAL) TRANSVERSE PERINEAL MUSCLE;[1] MUSCULUS TRANSVERSUS PERINEI PROFUNDUS, THE CONSTRICTOR OR COMPRESSOR URETHRÆ, OR DEEP TRANSVERSE PERINEAL MUSCLE.[1] THE ADJOINING PORTIONS OF THE GLUTEUS MAXIMUS, ADDUCTOR MAGNUS, AND GRACILIS MUSCLES.

Behind the anus, certain fasciculi of the superficial or external sphincter of the anus, attached to the skin and the anococcygeal ligament[2], have been divided in removing the skin and the ligament; in front of the anus, the fasciculi of the sphincter attached to the integument close to the median line have been left intact with the part of the superficial fascia in which they are inserted (the *central point of the perineum* of English anatomists).

[1] Toldt calls the *constrictor* or *compressor urethræ* muscle of English anatomists the *transversus perinei profundus* (the *deep* transverse perineal muscle), in contradistinction to the *transversus perinei superficialis* or *superficial* transverse perineal muscle. In England, however, the latter muscle is commonly spoken of as the *transversus perinei* muscle without qualification; whilst the hindmost, transverse fibres of the constrictor or compressor urethræ are occasionally distinguished as the *transversus perinei profundus* muscle.—TR.

[2] *Ligamentum anococcygeum*, the *anococcygeal ligament*, is a firm band of areolar tissue stretching in the median line from the tip of the coccyx to the skin of the hinder angle of the anus. It gives origin on each side to the fibres of the superficial or external sphincter of the anus.—TR.

Musculi perinei—Muscles of the perineum.


External or superficial sphincter of the anus
M. sphincter ani externus
Superficial layer
Deep layer
Connexion (at the central point of the perineum) of the bulbocavernosus or ejaculator urinæ muscle with the external or superficial sphincter of the anus
Ischiocavernosus or erector penis muscle
Bulbocavernosus or ejaculator urinæ muscle
Penis
Constrictor or compressor urethræ, or deep transverse perineal muscle [1]
M. transversus perinei profundus
Obturator membrane, or ligament
Membrana obturatoria
Tuberosity of the ischium
Tuber ischiadicum
Acetabulum
Obturator internus muscle
Spine of the ischium
Spina ischiadica
Anus with surrounding skin
Post-anal furrow, or crena clunium
Crena ani
Obturator fascia—Fascia obturatoria
Falciform process of the great sacrosciatic ligament
Processus falciformis
Posterior or great sacrosciatic ligament
Lig. sacrotuberosum
Anococcygeal ligament[2]
Lig. anococcygeum
*Ligament of the tip of the coccyx[3]
*Lig. apicis coccygis
3/4
Fourth posterior sacral foramen
Foramen sacrale posterius IV.
Posterior or great sacrosciatic ligament
Lig. sacrotuberosum
Coccygeus or levator coccygis muscle
Levator ani muscle
Pelvic diaphragm[4]
Diaphragma pelvis

[1] See note [1] to p. 527.

[2] See note [2] to p. 527.

[3] *Ligamentum Apicis Coccygis.*—"From the tip of the coccyx," writes Quain ("Anatomy," 10th ed., vol. ii., part ii., p. 178), "a fibrous band passes to the integument, which is often, especially in the infant, marked by a depression (*foveola coccygea*) at this spot." This is the ligament shown in the accompanying figure, and called by Toldt the **ligament of the tip of the coccyx*.—TR.

[4] See Appendix, note [87].

FIG. 916.—THE MUSCLES OF THE PERINEAL REGION OF THE MALE SEEN FROM THE LEFT SIDE. LEVATOR ANI, AND COCCYGEUS OR LEVATOR COCCYGIS MUSCLES, FORMING THE PELVIC DIAPHRAGM.

The skin surrounding the anus, and covering the coccyx and the lower part of the sacrum, has been drawn away from the tissues beneath, in order to display the radiation to the skin of fasciculi of the external or superficial sphincter of the anus (musculus sphincter ani externus). A portion of the posterior or great sacrosciatic ligament has been removed, in order to display somewhat more fully the inferior surface of the coccygeus or levator coccygis muscle.

Musculi perinei—Muscles of the perineum.

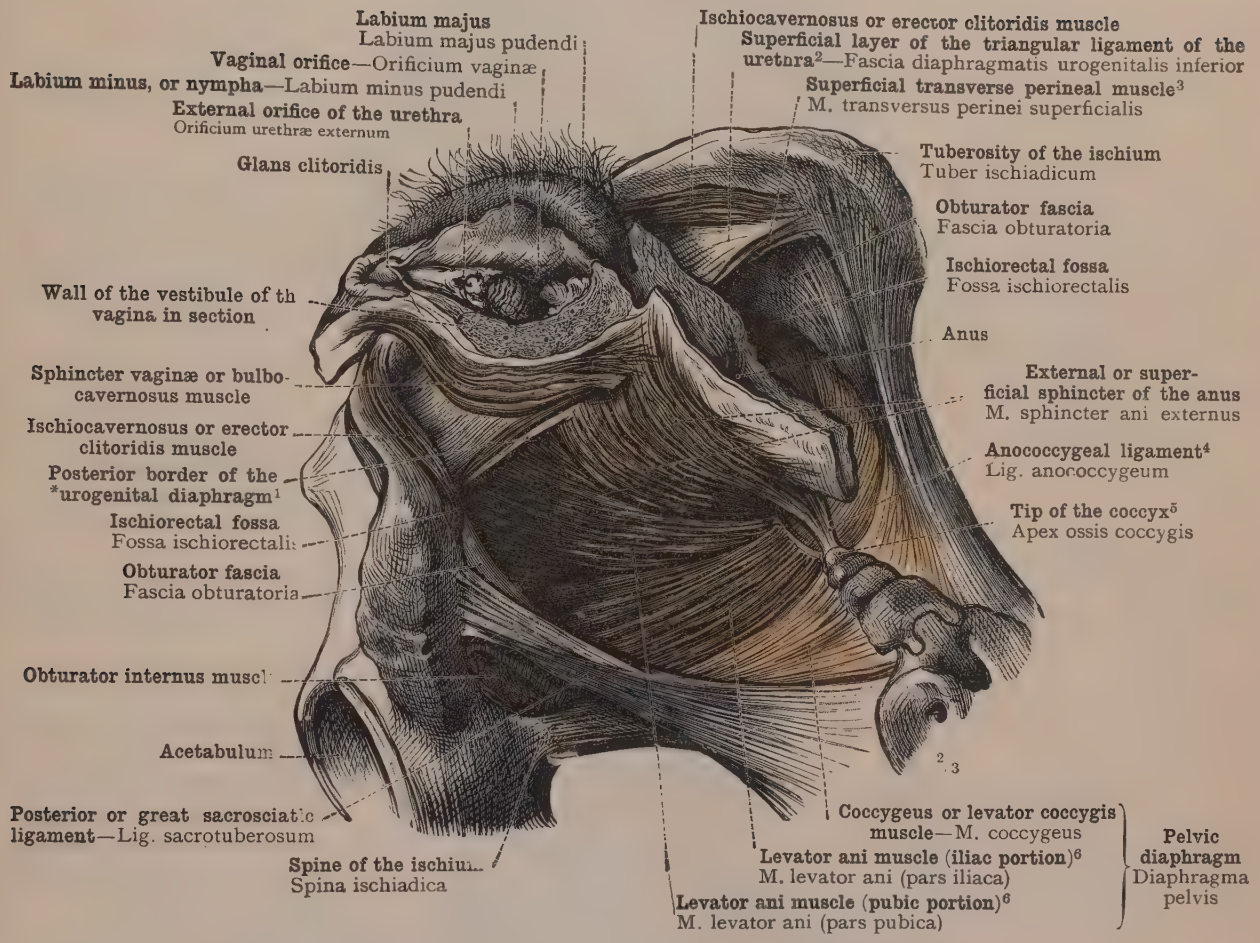


FIG. 917.—THE MUSCLES OF THE PERINEAL REGION OF THE FEMALE SEEN FROM THE LEFT SIDE. OF THE EXTERNAL GENITAL ORGANS, THE LABIUM MAJUS AND THE LABIUM MINUS OR NYMPHA HAVE BEEN REMOVED ON THE LEFT SIDE. LEVATOR ANI AND COCCYGEUS OR LEVATOR COCCYGIS MUSCLES, FORMING THE PELVIC DIAPHRAGM.

1 That is, the connected posterior borders of the superficial and deep layers of the triangular ligament of the urethra (see Appendix, note 99).—TR.

2 Known also as the *anterior* or *inferior* layer of the triangular ligament (see Appendix, note 99).

3 See note 1 to p. 527.

4 See note 2 to p. 527.

5 *Apex Ossis Coccygis.*—In the first part of this work (p. 32), I gave *extremity of the coccyx* as the English equivalent of this Latin term. The coccyx, however, has two extremities, and for this reason the expression *tip of the coccyx*, which, though somewhat colloquial, is employed by most anatomists to designate the inferior extremity of the coccyx, is to be preferred. Macalister, like Toldt, speaks of the *apex of the coccyx*, a term that would be more suitable if the coccyx were more distinctly triangular in form.—TR.

6 *Parts of the Levator Ani Muscle.*—The levator ani muscle is divided into two parts by a cleft beginning just below the obturator canal. The anterior portion only is directly connected with the rectum; it springs from the pubis and adjoining part of the fascial origin (*i.e.*, the **tendinous arch of the levator ani muscle*—see Appendix, note 98); it is called by Toldt the *pubic portion of the levator ani muscle*, and by Savage the *pubococcygeus muscle*. The posterior portion arises from the *white line of the pelvic fascia* behind the obturator canal and from the spine of the ischium; it is called by Toldt the *iliac portion of the levator ani muscle*, by Henle the *ischiococcygeus muscle*, and by Savage the *obturatococcygeus muscle*.—TR.

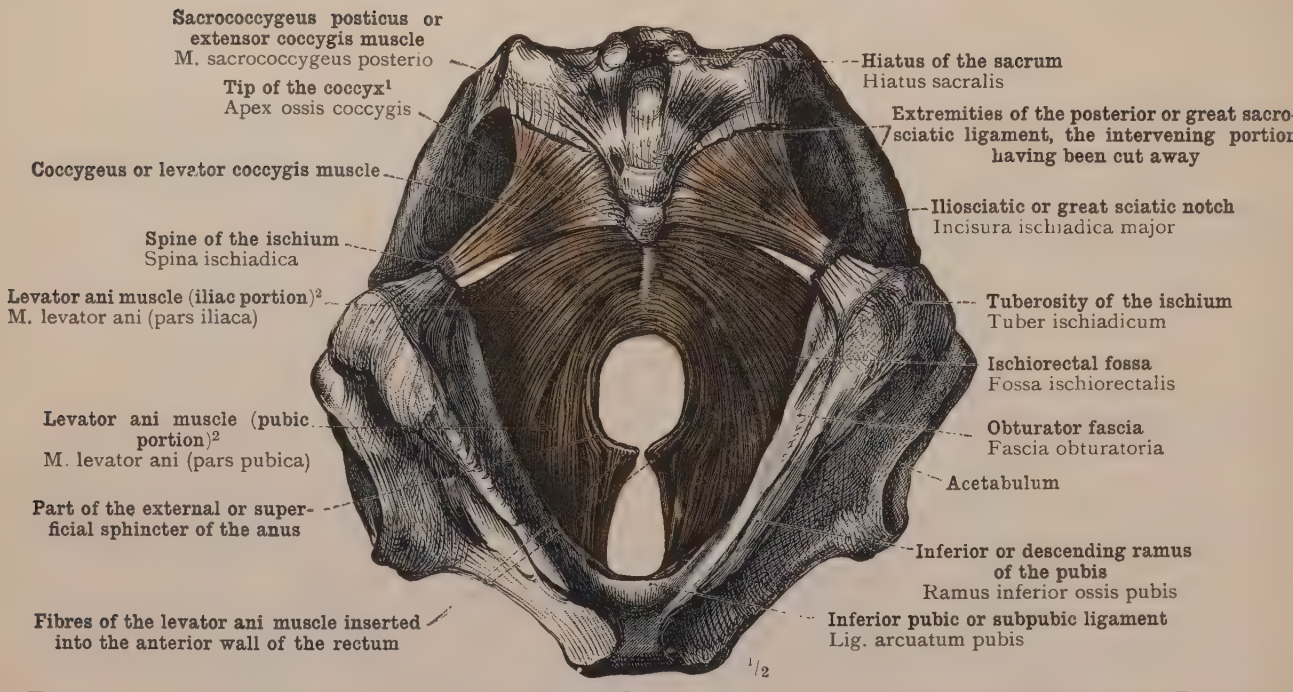

Sacrococcygeus posticus or extensor coccygis muscle
M. sacrococcygeus posterio
Tip of the coccyx[1]
Apex ossis coccygis
Coccygeus or levator coccygis muscle
Spine of the ischium
Spina ischiadica
Levator ani muscle (iliac portion)[2]
M. levator ani (pars iliaca)
Levator ani muscle (pubic portion)[2]
M. levator ani (pars pubica)
Part of the external or superficial sphincter of the anus
Fibres of the levator ani muscle inserted into the anterior wall of the rectum
Hiatus of the sacrum
Hiatus sacralis
Extremities of the posterior or great sacrosciatic ligament, the intervening portion having been cut away
Iliosciatic or great sciatic notch
Incisura ischiadica major
Tuberosity of the ischium
Tuber ischiadicum
Ischiorectal fossa
Fossa ischiorectalis
Obturator fascia
Fascia obturatoria
Acetabulum
Inferior or descending ramus of the pubis
Ramus inferior ossis pubis
Inferior pubic or subpubic ligament
Lig. arcuatum pubis
1/2

FIG. 918.—LEVATOR ANI AND COCCYGEUS OR LEVATOR COCCYGIS MUSCLES, SEEN FROM BELOW.

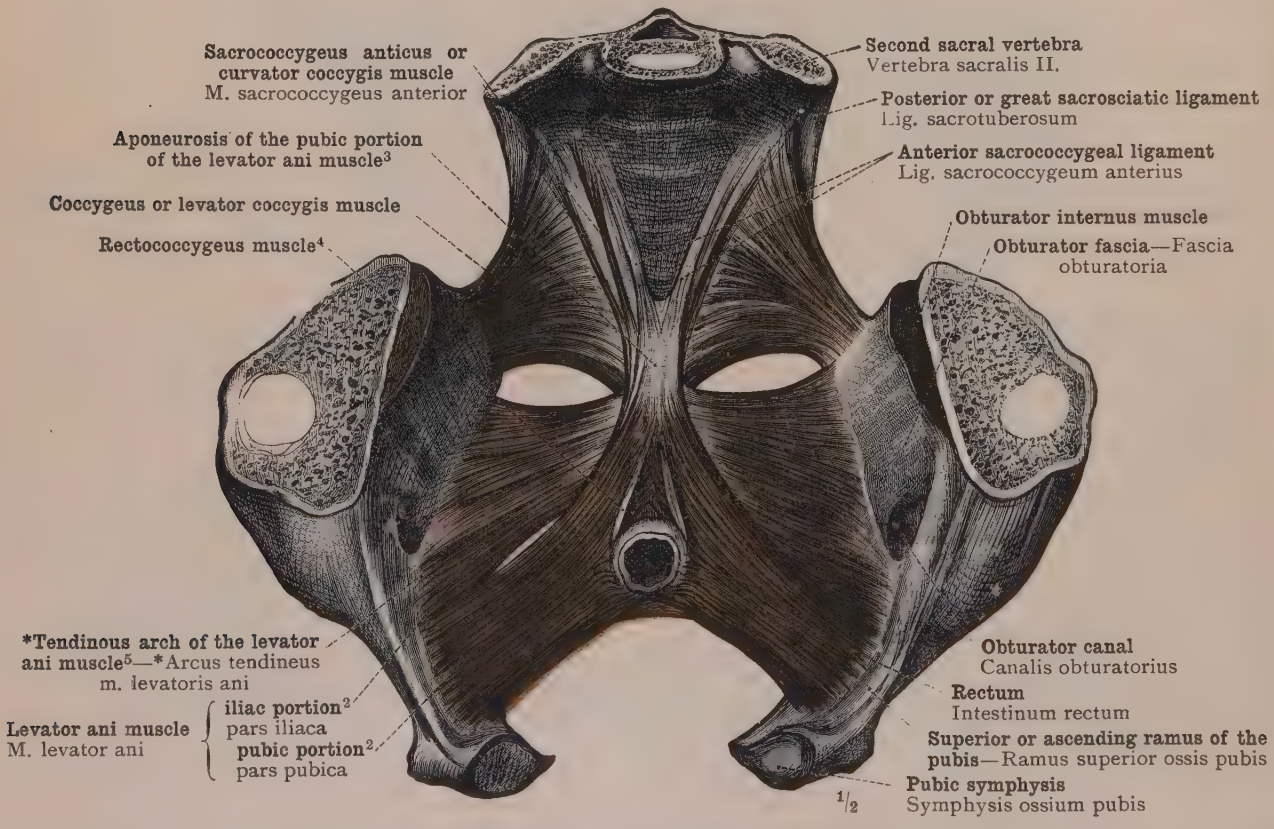


FIG. 919.—LEVATOR ANI AND COCCYGEUS OR LEVATOR COCCYGIS MUSCLES, SEEN FROM ABOVE.

After division of the pubic symphysis, the innominate bones have been drawn apart.

[1] See note 5 to p. 529. [2] See note 6 to p. 529. [3] Or *aponeurosis of the pubococcygeus muscle*. See note 6 to p. 529. [4] See Appendix, note 97. [5] See Appendix, note 98.

Musculi perinei—Muscles of the perineum.

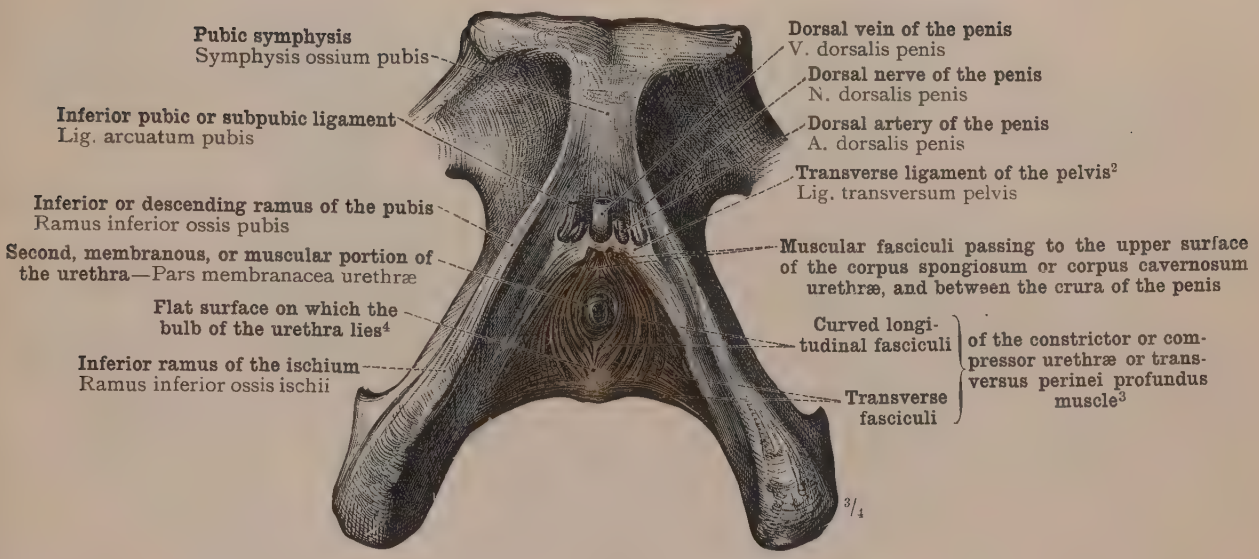

Pubic symphysis
Symphysis ossium pubis
Inferior pubic or subpubic ligament
Lig. arcuatum pubis
Inferior or descending ramus of the pubis
Ramus inferior ossis pubis
Second, membranous, or muscular portion of the urethra—Pars membranacea urethræ
Flat surface on which the bulb of the urethra lies[4]
Inferior ramus of the ischium
Ramus inferior ossis ischii
Dorsal vein of the penis
V. dorsalis penis
Dorsal nerve of the penis
N. dorsalis penis
Dorsal artery of the penis
A. dorsalis penis
Transverse ligament of the pelvis[2]
Lig. transversum pelvis
Muscular fasciculi passing to the upper surface of the corpus spongiosum or corpus cavernosum urethræ, and between the crura of the penis
Curved longitudinal fasciculi
Transverse fasciculi
of the constrictor or compressor urethræ or transversus perinei profundus muscle[3]
3/4

FIG. 920.—CONSTRICTOR OR COMPRESSOR URETHRÆ OR TRANSVERSUS PERINEI PROFUNDUS MUSCLE[3] OF THE MALE, FORMING THE MUSCULAR PART OF THE *UROGENITAL DIAPHRAGM.[1] SEEN FROM BEFORE AND BELOW.

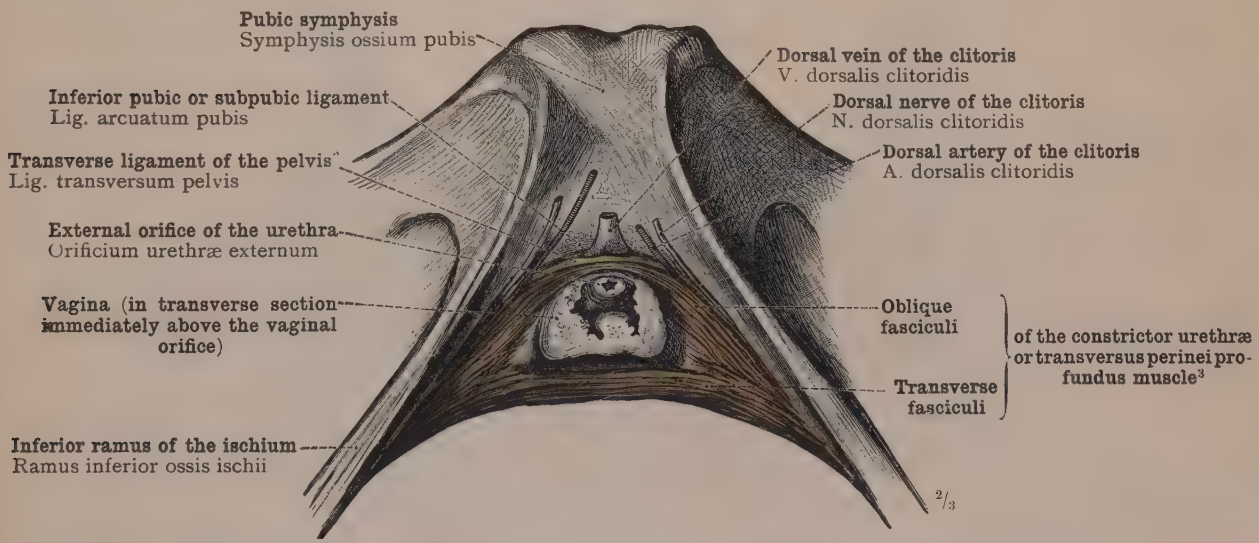

Pubic symphysis
Symphysis ossium pubis
Inferior pubic or subpubic ligament
Lig. arcuatum pubis
Transverse ligament of the pelvis[2]
Lig. transversum pelvis
External orifice of the urethra
Orificium urethræ externum
Vagina (in transverse section immediately above the vaginal orifice)
Inferior ramus of the ischium
Ramus inferior ossis ischii
Dorsal vein of the clitoris
V. dorsalis clitoridis
Dorsal nerve of the clitoris
N. dorsalis clitoridis
Dorsal artery of the clitoris
A. dorsalis clitoridis
Oblique fasciculi
Transverse fasciculi
of the constrictor urethræ or transversus perinei profundus muscle[3]
2/3

FIG. 921.—CONSTRICTOR URETHRÆ OR TRANSVERSUS PERINEI PROFUNDUS MUSCLE[3] OF THE FEMALE, FORMING THE MUSCULAR PART OF THE *UROGENITAL DIAPHRAGM.[1] SEEN FROM BEFORE AND BELOW.

[1] See Appendix, note 99. [2] See Appendix, note 100. [3] See Appendix, note 101.
[4] The superficial layer of the triangular ligament, of course, intervening.—TR.

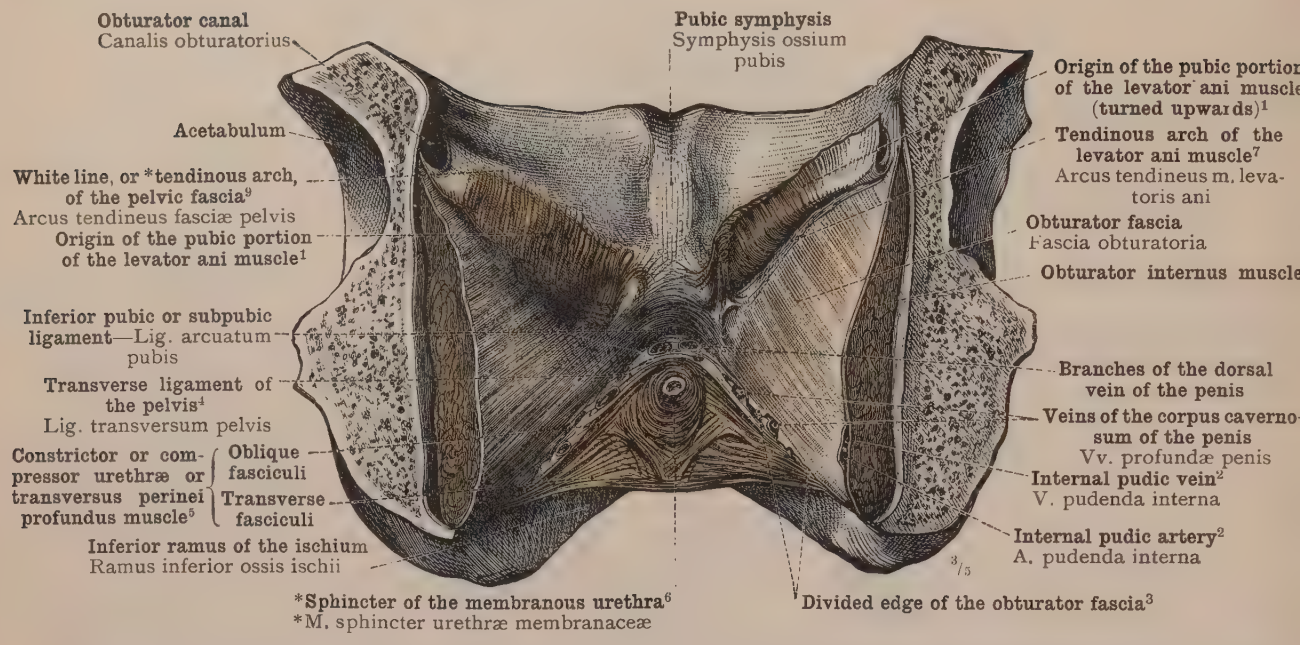

Obturator canal
Canalis obturatorius
Pubic symphysis
Symphysis ossium pubis
Origin of the pubic portion of the levator ani muscle (turned upwards)[1]
Acetabulum
Tendinous arch of the levator ani muscle[7]
Arcus tendineus m. levatoris ani
White line, or *tendinous arch, of the pelvic fascia[9]
Arcus tendineus fasciæ pelvis
Origin of the pubic portion of the levator ani muscle[1]
Obturator fascia
Fascia obturatoria
Obturator internus muscle
Inferior pubic or subpubic ligament—Lig. arcuatum pubis
Branches of the dorsal vein of the penis
Transverse ligament of the pelvis[4]
Lig. transversum pelvis
Veins of the corpus cavernosum of the penis
Vv. profundæ penis
Constrictor or compressor urethræ or transversus perinei profundus muscle[5]
Oblique fasciculi
Transverse fasciculi
Internal pudic vein[2]
V. pudenda interna
Inferior ramus of the ischium
Ramus inferior ossis ischii
Internal pudic artery[2]
A. pudenda interna
3/5
*Sphincter of the membranous urethra[6]
*M. sphincter urethræ membranaceæ
Divided edge of the obturator fascia[3]

FIG. 922.—CONSTRICTOR OR COMPRESSOR URETHRÆ OR TRANSVERSUS PERINEI PROFUNDUS MUSCLE[5] OF THE MALE, FORMING THE MUSCULAR PART OF THE *UROGENITAL DIAPHRAGM.[8] SEEN FROM BEHIND AND ABOVE. ORIGIN OF THE PUBIC PORTION OF THE LEVATOR ANI MUSCLE.[1]

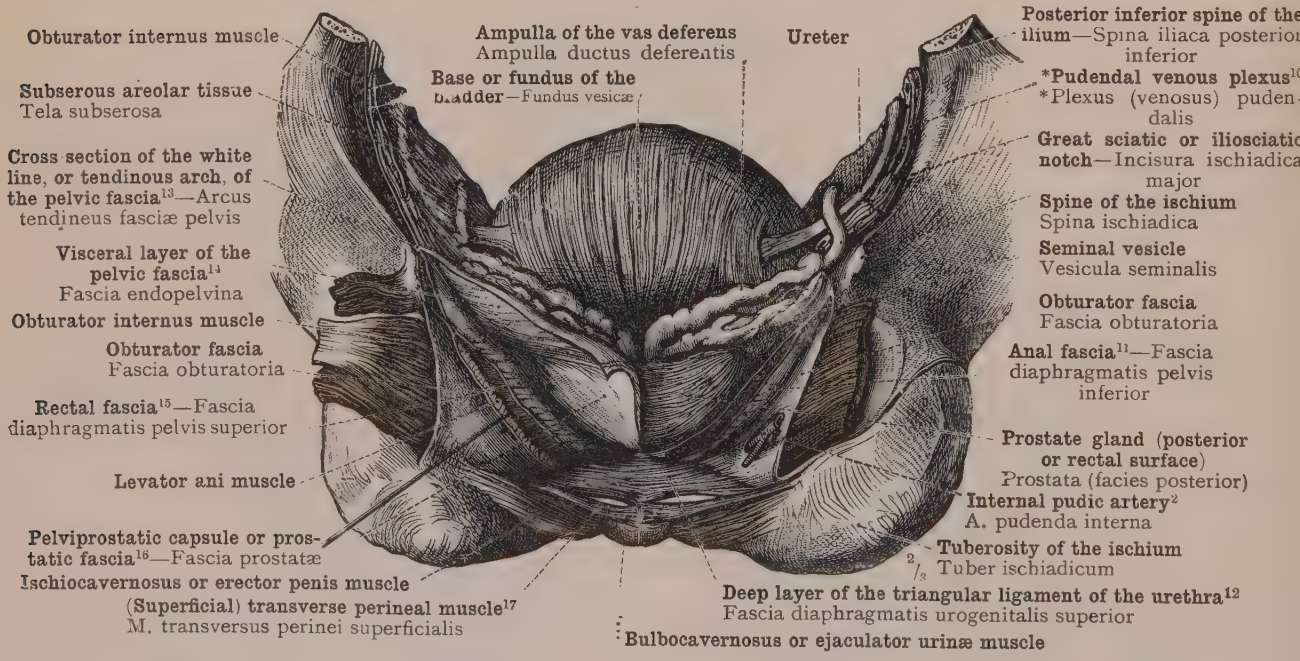
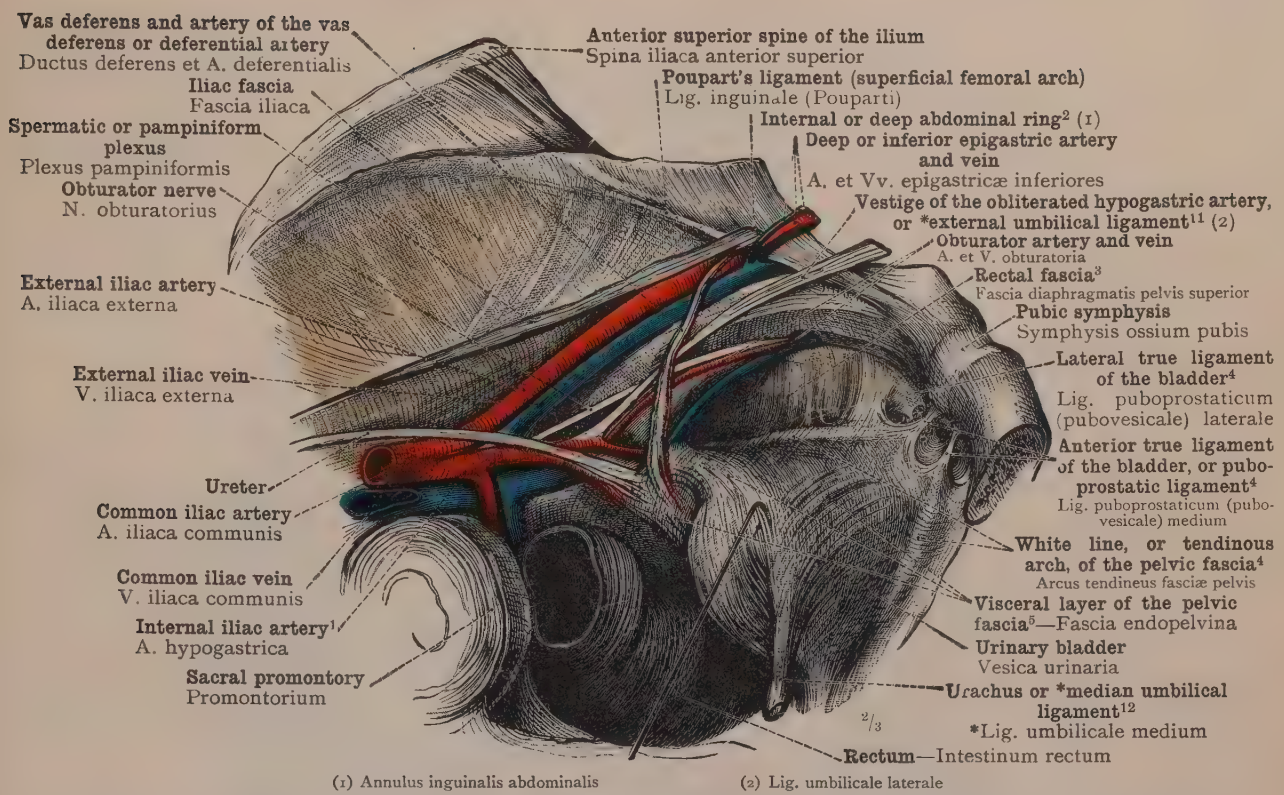

Obturator internus muscle
Ampulla of the vas deferens
Ampulla ductus deferentis
Ureter
Posterior inferior spine of the ilium—Spina iliaca posterior inferior
Base or fundus of the bladder—Fundus vesicæ
*Pudendal venous plexus[10]
*Plexus (venosus) pudendalis
Subserous areolar tissue
Tela subserosa
Great sciatic or iliosciatic notch—Incisura ischiadica major
Cross section of the white line, or tendinous arch, of the pelvic fascia[13]—Arcus tendineus fasciæ pelvis
Spine of the ischium
Spina ischiadica
Seminal vesicle
Vesicula seminalis
Visceral layer of the pelvic fascia[14]
Fascia endopelvina
Obturator internus muscle
Obturator fascia
Fascia obturatoria
Obturator fascia
Fascia obturatoria
Anal fascia[11]—Fascia diaphragmatis pelvis inferior
Rectal fascia[15]—Fascia diaphragmatis pelvis superior
Prostate gland (posterior or rectal surface)
Prostata (facies posterior)
Levator ani muscle
Internal pudic artery[2]
A. pudenda interna
Pelviprostatic capsule or prostatic fascia[16]—Fascia prostatæ
Tuberosity of the ischium
2/3
Tuber ischiadicum
Ischiocavernosus or erector penis muscle
(Superficial) transverse perineal muscle[17]
M. transversus perinei superficialis
Deep layer of the triangular ligament of the urethra[12]
Fascia diaphragmatis urogenitalis superior
Bulbocavernosus or ejaculator urinæ muscle

FIG. 923.—THE POSITION OF THE SEMINAL VESICLE AND OF THE AMPULLA OF THE VAS DEFERENS IN RELATION TO THE BASE OR FUNDUS OF THE BLADDER AND TO THE PROSTATE GLAND. FASCIÆ OF THE PELVIC OUTLET. SEEN FROM BEHIND.

The levator ani has been divided coronally. The pelviprostatic capsule or prostatic fascia[16] has on the right side been completely removed; on the left side, its upper part, extending over the seminal vesicle, has been detached from that organ, and turned backwards.

1 See note 6 to p. 529.
2 See Appendix, note 102.
3 See Appendix, note 103.
4 See Appendix, note 100.
5 See Appendix, note 101.
6 See Appendix, note 104.
7 See Appendix, note 98.
8 See Appendix, note 99.
9 See Appendix, note 59.
10 See Appendix, note 105.
11 See Appendix, notes 85 and 87.
12 See Appendix, note 99.
13 See Appendix. note 59.
14 See Appendix, note 106.
15 See Appendix, notes 86 and 87.
16 See Appendix, note 74.
17 See note 1 to p. 527.



(1) Annulus inguinalis abdominalis (2) Lig. umbilicale laterale

FIG. 924.—FASCIA ENDOPELVINA, THE VISCERAL LAYER OF THE PELVIC FASCIA (*see Appendix, note* [106]), WITH THE ARCUS TENDINEUS FASCIÆ PELVIS, THE WHITE LINE OR TENDINOUS ARCH OF THE PELVIC FASCIA (*see Appendix, note* [59]). THE POSITION OF THE VESSELS AND NERVES AT THE UPPER PART OF THE LATERAL WALL OF THE PELVIS. SEEN OBLIQUELY FROM ABOVE AND WITHIN.

The urinary bladder has been drawn away from the wall of the pelvis as far as possible in a backward and downward direction.

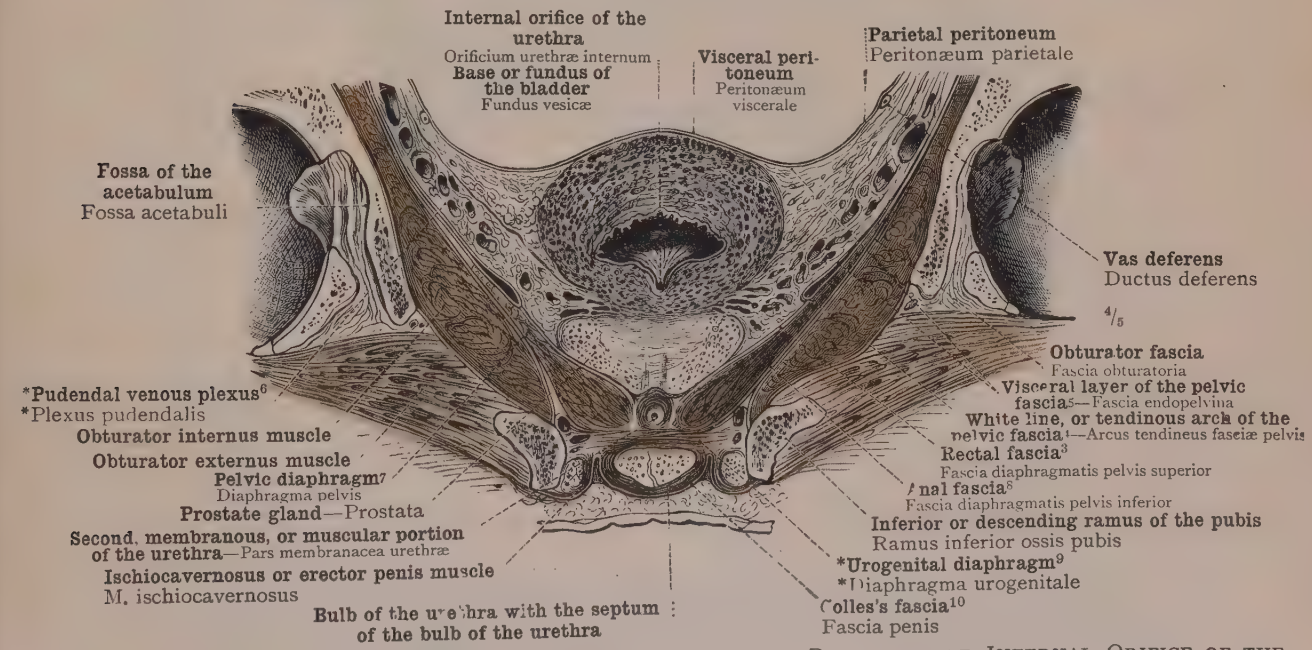


FIG. 925.—CORONAL SECTION THROUGH THE MALE PELVIS IN THE PLANE OF THE INTERNAL ORIFICE OF THE URETHRA. FASCIA ENDOPELVINA, THE VISCERAL LAYER OF THE PELVIC FASCIA (*see Appendix, note* [106]); FASCIA DIAPHRAGMATIS PELVIS SUPERIOR, THE RECTAL FASCIA (*see Appendix, notes* [86], [87], [106]); AND THE UPPER PART OF THE OBTURATOR FASCIA—AS CONSTITUENT PARTS OF THE PELVIC FASCIA. SEEN FROM BEFORE.

The urinary bladder is in a state of almost complete contraction.

1 See Appendix, note [107].
2 Called also the *internal inguinal aperture.*
3 See Appendix, notes [86], [87], [106].
4 See Appendix, note [59].
5 See Appendix, note [106].
6 See Appendix, note [105].
7 See Appendix, note [87].
8 See Appendix, notes [85], [87].
9 See Appendix, note [99].
10 See note [2] to p. 526.
11 See note [4] to p. 387 in Part III.
12 See note [3] to p. 387 in Part III.

Fascia pelvis et fascia endopelvina—The pelvic fascia and its visceral layer.

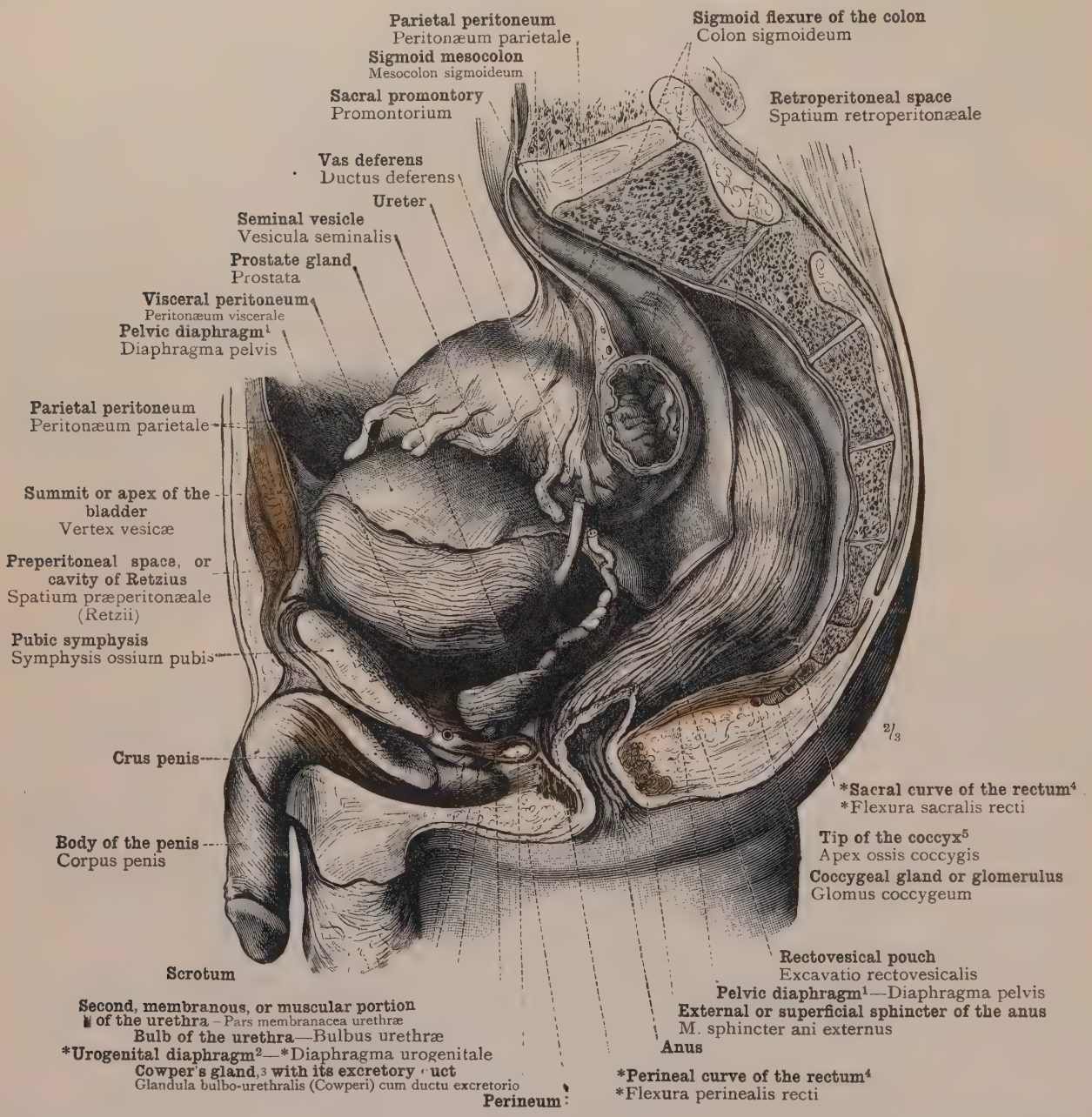


FIG. 926.—POSITION OF THE PELVIC VISCERA IN THE MALE AND THEIR RELATIONS TO THE MUSCLES OF THE PELVIC OUTLET (OR PERINEAL MUSCLES), SHOWN IN THE RIGHT HALF OF THE PELVIS, SEEN FROM THE LEFT SIDE.

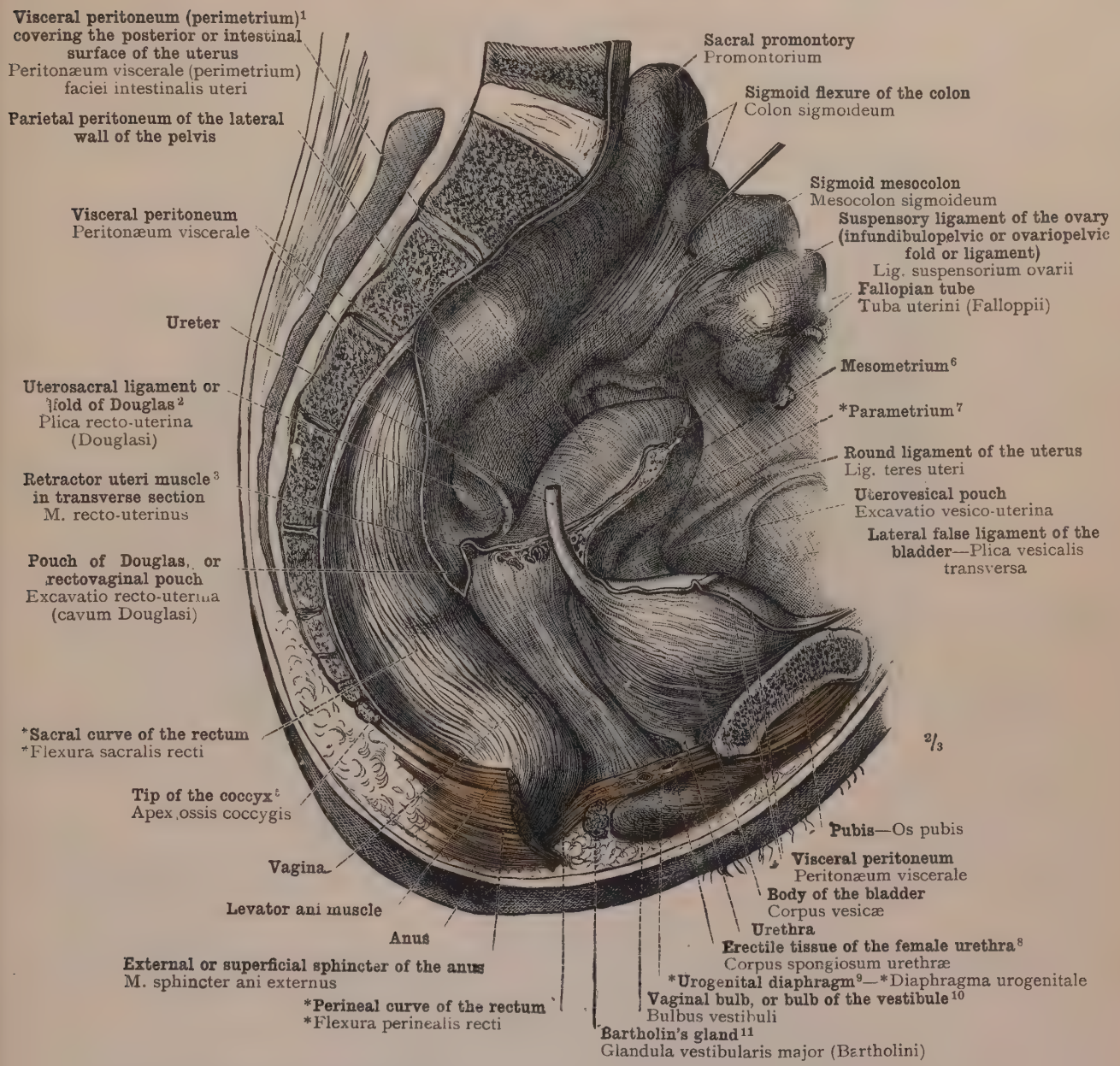
The urinary bladder is fully distended, the rectum nearly empty.

[1] See Appendix, note 87. [2] See Appendix, note 99. [3] Known also as the *suburethral gland.*

[4] **Curves of the Rectum.*—"The rectum follows the posterior wall of the pelvis, in a curve the concavity of which is directed forward, as far as the tip of the coccyx, and thence, still continuing the same curve, runs forwards along the upper surface of the posterior part of the pelvic diaphragm; then, bending downwards and a little backwards at an angle slightly more obtuse than a right angle, it perforates that diaphragm in a direction perpendicular to its plane to form the anal canal. In this course the rectum describes two curves: a larger, with the concavity directed forwards, *flexura sacralis;* and a smaller, with the concavity directed backwards, *flexura perinealis*" (Von Langer and Toldt's "Anatomy," 7th ed., pp. 446, 447). In choosing English equivalents for these terms (which are not to be found in the works of Quain and Macalister), I have preferred to speak of the *sacral* and *perineal curves of the rectum*, for the reason that the former, at any rate, is too prolonged and too open a bend to be appropriately termed a flexure.—TR.

[5] See note 5 to p. 529.

Topographical Anatomy of the Pelvic Viscera.



[1] *Perimetrium.*—This name, for the peritoneal coat of the uterus, is rarely employed by English anatomists. Clinically, however, the derivative term *perimetritis* is in frequent use.—Tr.

[2] Known also as the *recto-uterine fold* or *ligament*. See note 3 to p. 510.

[3] Quain mentions the presence in the folds of Douglas of some non-striped muscular fibres, but leaves them unnamed. Macalister, however, calls them the *retractores uteri*.—Tr.

[4] See note 4 to p. 534. [5] See note 5 to p. 529.

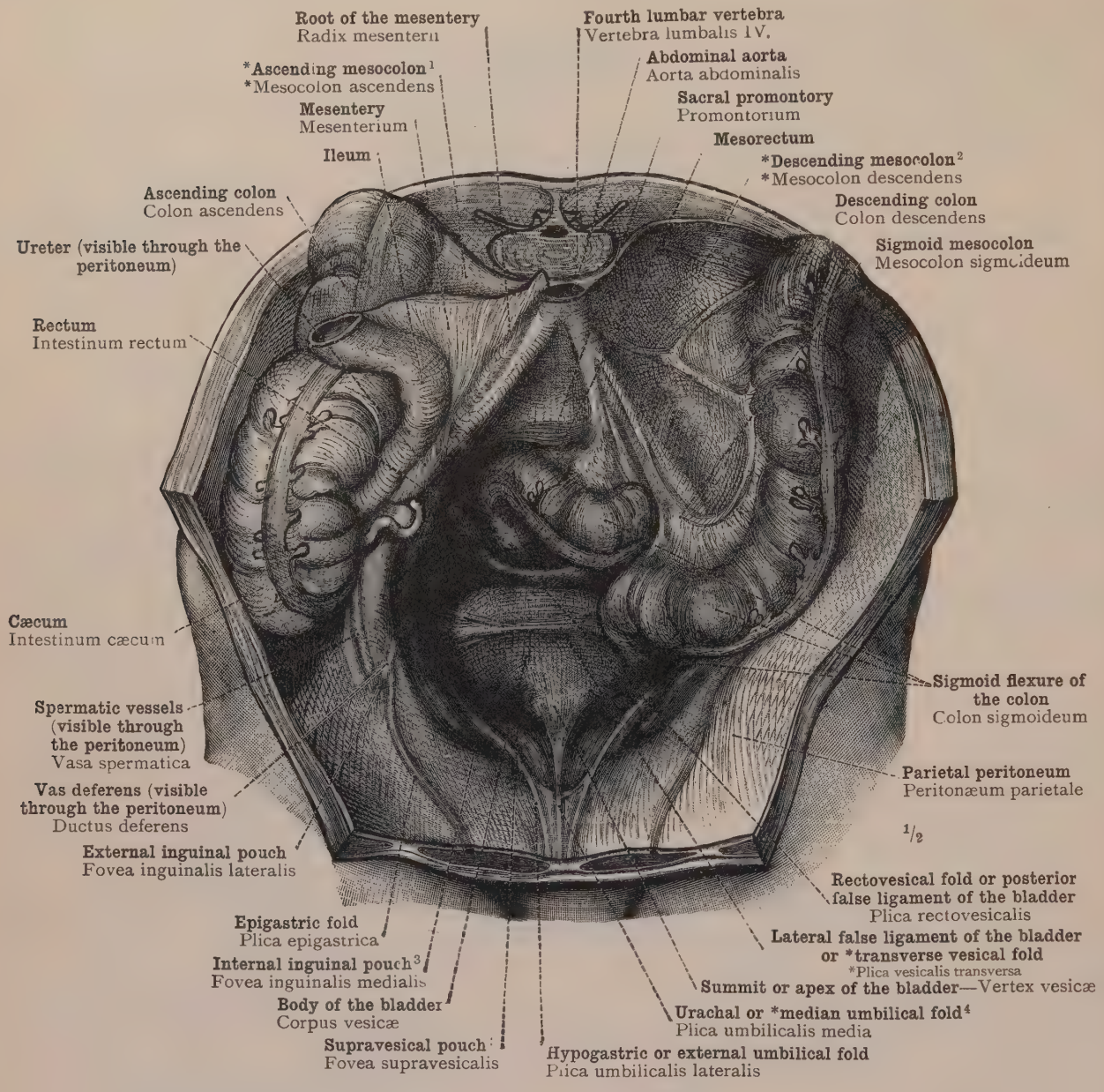
[6] See Appendix, note 82. [7] See Appendix, note 84. [8] See Appendix, note 108. [9] See Appendix, note 99.

[10] See Appendix, note 91. [11] Known also as *Duverney's gland* or the *suburethral gland*. See Appendix, note 66.

FIG. 927.—POSITION OF THE PELVIC VISCERA IN THE FEMALE, AND THEIR RELATIONS TO THE MUSCLES OF THE PELVIC OUTLET (OR PERINEAL MUSCLES), SHOWN IN THE LEFT HALF OF THE PELVIS, SEEN FROM THE RIGHT SIDE. THE *PARAMETRIUM (*see Appendix, note* 84).

The urinary bladder and the rectum are nearly empty. The sigmoid flexure of the colon has been drawn up out of Douglas's pouch, and the right broad ligament of the uterus, the right Fallopian tube, the right ovary, and the right round ligament of the uterus, have been cut away together by a sagittal section passing close to the body of the uterus. The connexion of the two layers of the broad ligament of the uterus with the parietal peritoneum of the floor of the pelvis is seen, also the reflection of the visceral peritoneum covering the uterus (*perimetrium—see note* 1 *above*) on to the wall of the bladder in front and the wall of the rectum behind.

Topographical Anatomy of the Pelvic Viscera.



[1] See Appendix, note 39. [2] See note [1] to p. 453.

[3] By some authorities the space between the *urachal fold* and the *hypogastric fold* (called here *supravesical pouch*) is named the *internal inguinal pouch*; and the space between the *hypogastric fold* and the *epigastric fold* (called here *internal inguinal pouch*) is named the *middle inguinal pouch*. The author's nomenclature is to be preferred. — Tr.

[4] Often called the *superior false ligament of the bladder*, and sometimes the *suspensory ligament of the bladder*.

FIG. 928.—VIEW FROM ABOVE AND BEFORE OF THE PELVIC VISCERA OF THE MALE *IN SITU* AND COVERED BY THE PERITONEUM: THE BODY AND THE SUMMIT OR APEX OF THE BLADDER AND THE UPPERMOST PORTION OF THE RECTUM. THE POSITION OF THE CÆCUM AND OF THE SIGMOID FLEXURE OF THE COLON. THE RELATIONS OF THE PERITONEUM IN THE PELVIC CAVITY AND ON THE ADJOINING PORTION OF THE ANTERIOR WALL OF THE ABDOMEN: PLICA UMBILICALIS MEDIA, THE URACHAL OR *MEDIAN UMBILICAL FOLD (*see note* [4] *above*); PLICA UMBILICALIS LATERALIS, THE HYPOGASTRIC OR *EXTERNAL UMBILICAL FOLD; PLICA VESICALIS TRANSVERSA, THE LATERAL FALSE LIGAMENT OF THE BLADDER OR *TRANSVERSE VESICAL FOLD; PLICA RECTOVESICALIS, THE RECTOVESICAL FOLD OR POSTERIOR FALSE LIGAMENT OF THE BLADDER. THROUGH THE PERITONEUM, THE FOLLOWING STRUCTURES ARE VISIBLE: THE EPIGASTRIC ARTERY, THE URETER, THE VAS DEFERENS, AND THE SPERMATIC VESSELS.

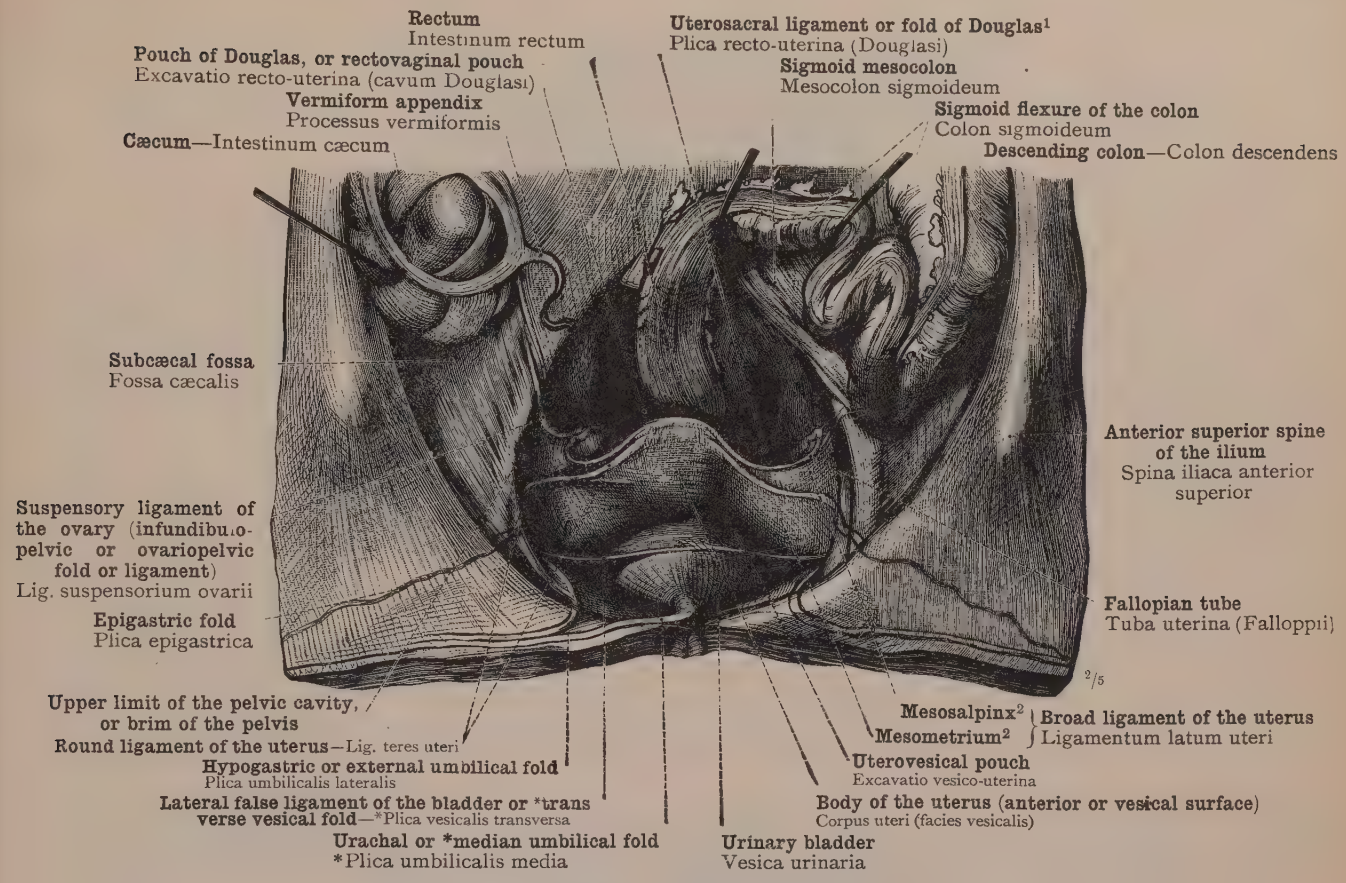


FIG. 929.—PELVIC VISCERA OF A FEMALE AGED TWENTY-NINE YEARS, SEEN FROM ABOVE AND BEFORE.

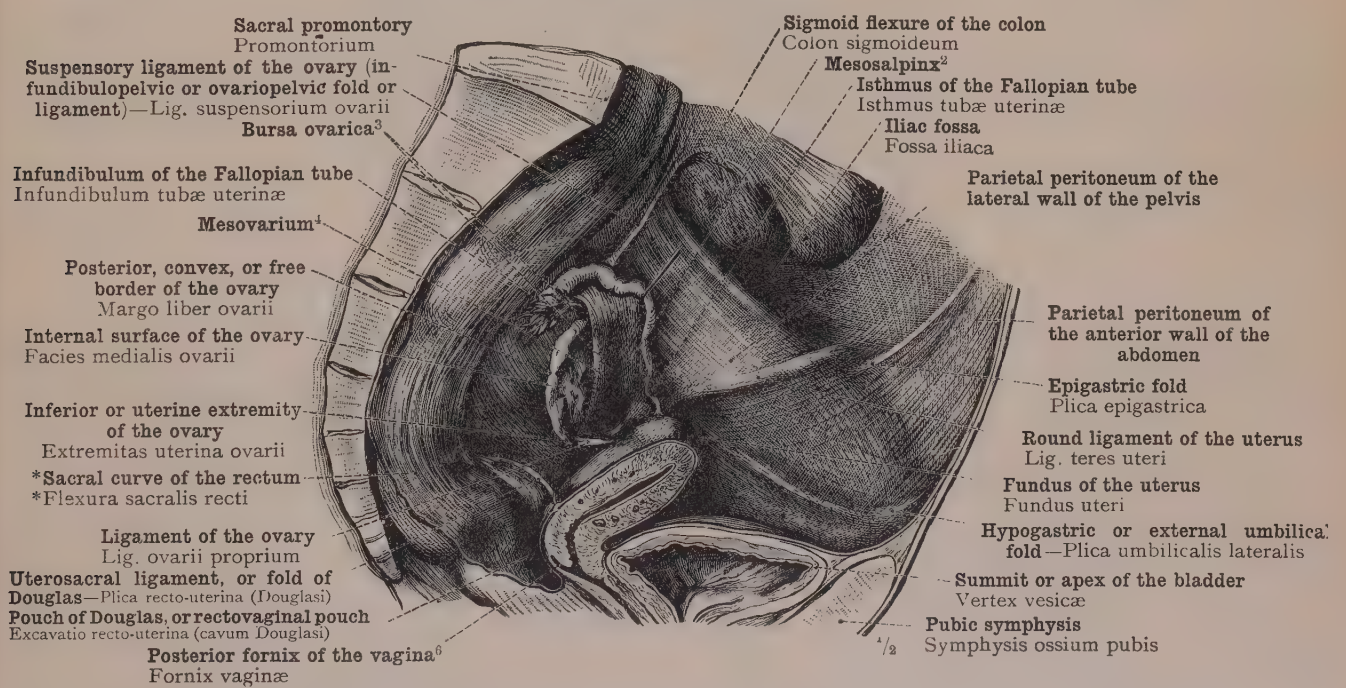

Sacral promontory
Promontorium
Sigmoid flexure of the colon
Colon sigmoideum
Suspensory ligament of the ovary (infundibulopelvic or ovariopelvic fold or ligament)—Lig. suspensorium ovarii
Mesosalpinx[2]
Isthmus of the Fallopian tube
Isthmus tubæ uterinæ
Bursa ovarica[3]
Iliac fossa
Fossa iliaca
Infundibulum of the Fallopian tube
Infundibulum tubæ uterinæ
Parietal peritoneum of the lateral wall of the pelvis
Mesovarium[4]
Posterior, convex, or free border of the ovary
Margo liber ovarii
Parietal peritoneum of the anterior wall of the abdomen
Internal surface of the ovary
Facies medialis ovarii
Epigastric fold
Plica epigastrica
Inferior or uterine extremity of the ovary
Extremitas uterina ovarii
Round ligament of the uterus
Lig. teres uteri
*Sacral curve of the rectum
*Flexura sacralis recti
Fundus of the uterus
Fundus uteri
Ligament of the ovary
Lig. ovarii proprium
Hypogastric or external umbilical fold—Plica umbilicalis lateralis
Uterosacral ligament, or fold of Douglas—Plica recto-uterina (Douglasi)
Summit or apex of the bladder
Vertex vesicæ
Pouch of Douglas, or rectovaginal pouch
Excavatio recto-uterina (cavum Douglasi)
Pubic symphysis
Symphysis ossium pubis
1/2
Posterior fornix of the vagina[6]
Fornix vaginæ

FIG. 930.—POSITION OF THE OVARY IN RELATION TO THE LATERAL WALL OF THE PELVIS.

The Fallopian tube has been drawn upwards, and the cavity of the bursa ovarica (*see Appendix, note* 79) has thus been obliterated.

1 Known also as the *recto-uterine fold* or *ligament*. See note 3 to p. 510. 2 See Appendix, note 82.
3 See Appendix, note 81. 4 See Appendix, note 82. 5 See note 4 to p. 534. 6 See Appendix, note 78.
7 Often called the *superior false ligament of the bladder*, and sometimes the *suspensory ligament of the bladder*.

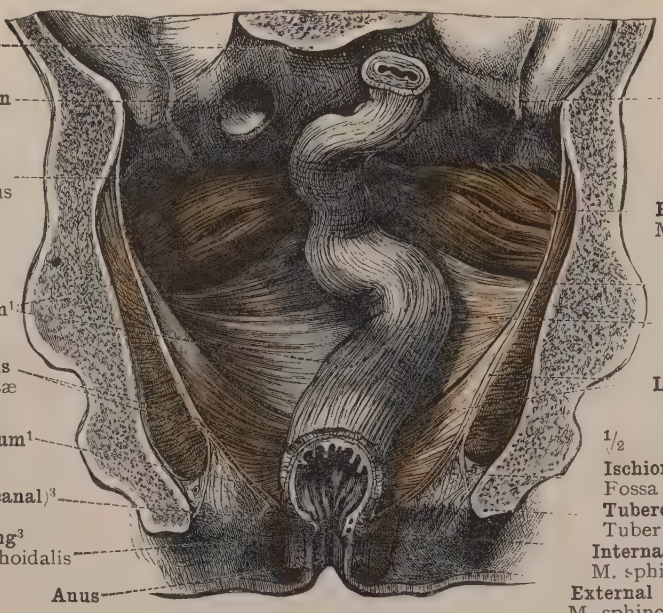


FIG. 931.—POSITION AND FORM OF THE EMPTY AND CONTRACTED RECTUM AS SEEN IN A CORONAL SECTION THROUGH THE PELVIS OF A FROZEN BODY. SEEN FROM BEFORE.

The inferior extremity of the rectum is opened by a section passing obliquely downwards and backwards. After removing the peritoneum and the great vessels, the muscles of the pelvis have been exposed.

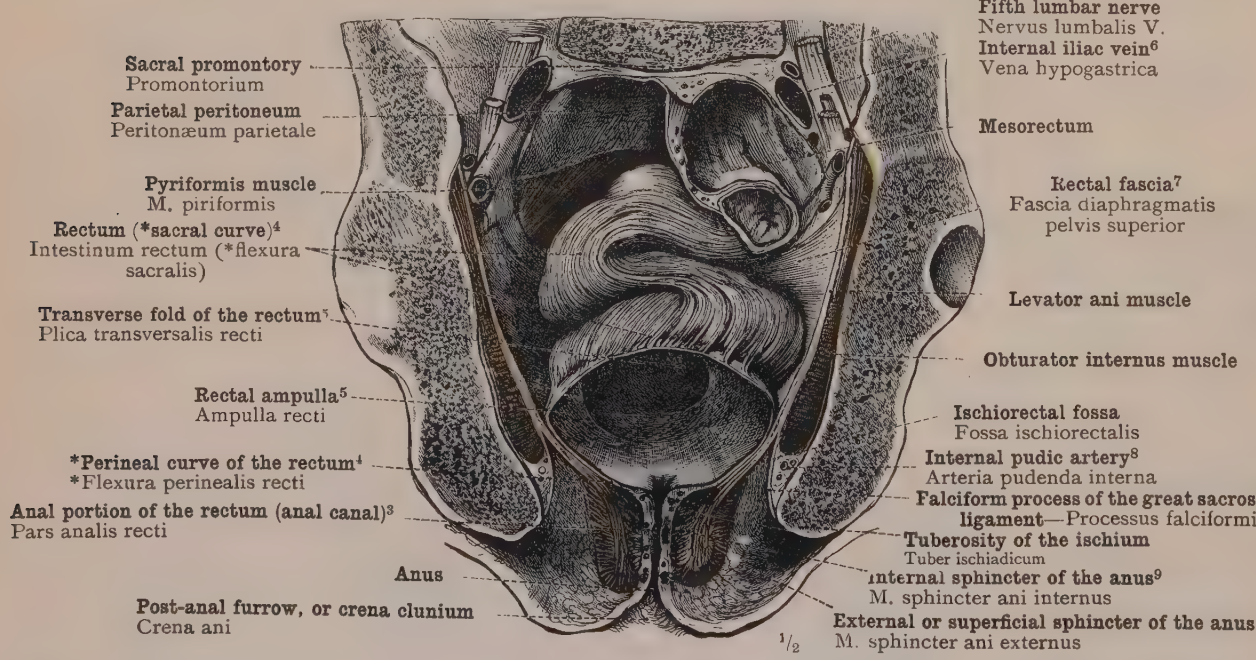


FIG. 932.—POSITION AND FORM OF THE RECTUM WHEN GREATLY DISTENDED WITH FÆCES, AS SEEN IN A CORONAL SECTION THROUGH THE PELVIS OF A FROZEN BODY. SEEN FROM BEFORE.

In the region of the first and second sacral vertebræ, the peritoneum and the mesorectum have been left intact; in the lower part of the pelvis, the pelvic fascia is laid bare. The inferior extremity of the rectum has been opened as in the previous figure.

1 See note 4 to p. 534. 2 Known also as the *deep* or *circular sphincter of the anus.* 3 See Appendix, note 12. 4 See note 4 to p. 534.
5 See Appendix, note 109. 6 See Appendix, note 107. 7 See Appendix, notes 86, 87, and 106.
8 See Appendix, note 110. 9 Known also as the *deep* or *circular sphincter of the anus.*

APPENDIX TO PART IV.

NOTES BY TRANSLATOR

[1] *Lingual Duct* (Fig. 675, p. 420).—According to His, the foramen cæcum indicates the position of the epithelial outgrowth from which the middle portion of the thyroid body has been formed. As in course of development the thyroid body becomes more remote from the tongue, a long, slender tube, connecting it with that organ, persists, the *thyroglossal duct* or *subtracheal tube*. The upper part of this tube may remain pervious as a canal leading from the foramen cæcum towards the hyoid bone. This is known as the *lingual duct*. (His, "Der Tractus Thyroglossus und seine Beziehungen zum Zungenbein," *Archiv. für Anatomie*, 1891. But see also Kanthack's views in his article on "The Thyreoglossal Duct," *Journal of Anatomy and Physiology*, 1891.)

[2] *Periglottis* (Fig. 675, p. 420).—This somewhat inappropriate name is given by Macalister to the structure shown in the figure, a tough, elastic, areolar and fatty mass, which intervenes between the front of the epiglottis and the back of the thyrohyoid membrane. It was at one time, but erroneously, called the *epiglottic gland*. The middle portion of the upper border of the periglottis is elastic, and constitutes the *hyo-epiglottic ligament*. Still higher, a median sagittally placed fold attaches it to the base of the tongue, and it is the mucous membrane covering this fold that forms the *median glosso epiglottic fold*, or *frænum epiglottidis*. (See Fig. 673, p. 419.)

[3] *Sublingual Ducts* (Fig. 687, p. 424).—I have preferred in the text the names of *greater sublingual duct* and *lesser sublingual ducts* for the excretory ducts of the sublingual gland, for the reason that the other names used by English anatomists to denote these structures are applied in a somewhat conflicting manner. Quain terms the *lesser ducts*, six to twenty in number, the *ducts of Rivinus*. They open separately in a row along the sublingual fold; the foremost of their number, however, usually terminates in the duct of Wharton. The long slender duct (proceeding, according to Toldt, from the *anterior* lobe of the gland) which runs parallel with the duct of Wharton, called in the text *greater sublingual duct*, may join the duct of Wharton near its anterior extremity, but more commonly has an independent orifice beside that duct on the submaxillary papilla. To this duct Quain gives the name of *duct of Bartholin*. Macalister, on the other hand, calls the lesser ducts the *ducts of Walther*, and to the greater duct (which he describes as proceeding from the *posterior* lobe of the sublingual gland, and therefore nearly an inch in length) he gives the name of *duct of Rivini*. Macalister's authority notwithstanding, this duct is far more often spoken of as the *duct of Bartholin*.

[4] *Note on the Anatomy of the Lateral Wall of the Naso-pharnyx* (Fig. 710, p. 436).—"The pharyngeal orifice of the Eustachian tube is bounded in front by a small fold passing to the soft palate, the *salpingopalatine fold;* and below the orifice of the tube is to be seen a more or less prominent swelling over the fibres of the levator palati muscle, the so-called *levator prominenc* [or *levator cushion*, according to Quain]. From the lower end of the cushion of the Eustachian orifice [which bounds that orifice above and behind] a vertical fold of mucous membrane, the *salpingopharyngeal fold*, extends downwards, and is lost below in the lateral wall of the pharynx" (Von Langer and Toldt's "Anatomy," p. 301). "The posterior extremity of the outer wall of the nasal fossæ consists of a shallow vertical furrow, the *posterior nasal sulcus*, immediately behind the posterior extremities of the middle and inferior turbinate bones. This is situated over the hinder part of the vertical plate of the palate bone and the internal pterygoid plate, and represents the *nasopharyngeal meatus* of lower mammals" (*op. cit.*, p. 297). "The part of the inferior meatus which lies behind the incisor canal, together with the space immediately behind the posterior end of the superior and middle turbinals as far back as the orifice of the Eustachian tube, belongs to the primitive buccal cavity of the fœtus, having become separated from the permanent mouth by the growth of the palate. It is known as the *nasopharyngeal part* (*ductus nasopharyngeus*), and its mucous membrane is marked off behind from that of the pharynx by a prominence which is termed the *nasopharyngeal fold*" (Quain's "Anatomy," 10th ed., vol. iii., part iii., p. 138).

[5] (Fig. 711, p. 438.) "Two lateral bands (*ligaments of Helvetius*), mostly of connective tissue, but containing a few muscular fibres belonging to the longitudinal layer, produce the sacculation of the antrum pylori" (Macalister's "Anatomy," pp. 396, 397).

[6] **Superior and* **Inferior Flexure of the Duodenum* (Ibid.).—These flexures are not named by Quain or Macalister. The *superior flexure* is between the *superior* and the *descending portion* of the duodenum; and the *inferior flexure* is between the *descending* and the *transverse portion* of the duodenum. (See note [7] below.)

[7] (Ibid.) The *duodenum* was formerly described as consisting of three portions: *first*, or *superior; second*, or *middle;* and *third*, or *inferior*. The first two parts of the old description are now usually called *superior* and *descending* portions, respectively; while the third or inferior part of the old description has been divided into two, called respectively *transverse* and *ascending* portions.

[8] (Fig. 712, p. 438.) Though the author uses the term *valvula pylori*, there is at the pylorus no valve, properly so called, and I have therefore avoided using that term in the translation.

[9] *Diverticulum Duodenale* (*Vateri*) (Figs. 718, 719, p. 440).—This so-called diverticulum is a sac-like dilatation of the extremity of the united common bile-duct and pancreatic duct, or duct of Wirsung, as it passes obliquely through the duodenal wall. The dilatation is so frequently met with that it can hardly be regarded as pathological. The vertical fold covering the diverticulum is called by Macalister *caruncula major*, and the smaller vertical fold beneath the orifice of the diverticulum, *frænulum caruncuiæ*. See Macalister, *op. cit.*, pp. 402 and 412, and Quain, *op. cit.*, vol. iii., part iv., p. 142.

[10] (Fig. 719, p. 440.) The author regards the folds in the duodenal diverticulum as valvular in nature, their function being to prevent the entrance of intestinal secretions into the common bile-duct and the pancreatic duct.

[11] *Plica Transversalis Recti* (Fig. 736, p. 445).—"When the rectum is empty and contracted, it exhibits numerous folds, most of which are obliterated by distension. Several transverse or oblique folds are, however, of a more permanent character, and have been designated 'valves of the rectum'

(Houston) or 'plicæ recti.' One of these, usually the largest, is situated on the right side opposite the reflection of the peritoneum from the rectum to the bladder, and was named by Kohlrausch the *plica transversalis recti*. There are generally two other folds, both on the left side, one about an inch above, the other about the same distance below, the fold on the right side. From the position and projection of these folds they may more or less impede the introduction of instruments. The dilatation of the rectum between the anal canal and the lowest of these folds is called the *rectal ampulla*" (Quain, "Anatomy," 10th ed., vol. iii., part iv., pp. 115, 116). According to Von Langer and Toldt ("Anatomy," 7th ed., pp. 337, 338), the *plica transversalis recti* is on the right and anterior walls of the rectum, about 10 centimetres (4 inches) from the anus (in Fig. 736, 2 inches only). In its substance is the thickening of the circular muscular fibres of the rectum which is known as the *sphincter ani tertius*. According to these authors, *Houston's valves* are prominent only when the rectum is greatly distended, and are obliterated when the organ is quite empty and contracted.

[12] *The Columns of the Rectum, the *Sinuses of the Rectum, and the Hæmorrhoidal Ring* (Ibid.).—"We have to mention a further peculiarity of the lower end of the rectum, one which marks the transition from the mucous membrane to the skin. There are in this region from five to eight longitudinally disposed elevations of the mucous membrane, the *columnæ rectales* of Morgagni, which widen as they approach the anus. Here their lower ends unite to form a ringed swelling, the *annulus hæmorrhoidalis*, surrounding the gut; and the columns and the ring thus bound a number of depressions or pockets in the mucous membrane, the *sinus rectales*. This portion of the rectum, in the male about 2·6 centimetres (1 inch) in length, but somewhat shorter in the female, is known as the *pars analis recti*, or *anal canal;* while the actual external orifice is termed the *anus*" (Von Langer and Toldt, *op. cit.*, p. 338).

[13] (Fig. 737, p. 446.) Folds of peritoneum connecting a solid viscus with the abdominal wall are called *ligaments;* those passing from one viscus to another are called *omenta;* but the distinction is not always strictly maintained.

[14] **Fibrous Appendix of the Liver* (Figs. 737, 738, p. 446).—"Attached to the free extremity of the left lobe of the liver there is often a membranous appendix, *appendix fibrosa hepatis*, of variable size, from which the parenchyma of the liver has completely disappeared, only connective tissue and *aberrant vessels* remaining. The disappearance of the parenchymatous tissue in this region can perhaps be explained in the following manner: In the embryo the umbilical veins open into the left portal vein, so that the left lobe of the liver is directly supplied with arterial blood from the placenta, and is thus placed under more favourable nutritive conditions than the right lobe; but this advantage is lost with the cessation of the placental circulation. . . . After the disappearance of the parenchyma, however, the bile-ducts, and the branches of the portal vein and hepatic artery, persist, and all of these structures are included in the term *vasa aberrantia hepatis*" (Von Langer and Toldt's "Anatomy," 7th ed., p. 349). In rare cases there may be a small *accessory liver* in the situation of the fibrous appendix, connected with the left lobe by a fold of peritoneum and a leash of vessels. (See also note [17] below.)

[15] **Ligament of the Ductus Venosus* (Fig. 738, p. 446).—This is a fine white cord, the vestige of the obliterated ductus venosus, lying in the *fissure of the ductus venosus* (the posterior portion of the *longitudinal fissure*). It is not usually termed a *ligament* by English anatomists.

[16] *Lobes of the Liver* (Ibid.).—The author enumerates *four lobes* only: *lobus dexter*, right lobe; *lobus sinister*, left lobe; *lobus quadratus*, quadrate lobe; and *lobus caudatus* (*Spigeli*), caudate lobe (of Spigelius): the ridge connecting the *lobus dexter* with the *lobus quadratus* (*Spigeli*), between the *transverse* or *portal fissure* (below), and the lower extremity of the *fissure* or *fossa of the vena cava* (above), he calls the *processus caudatus* (see Fig. 740, p. 447). English anatomists enumerate *five lobes:* the *right*, the *left*, the *quadrate*, the *Spigelian*, and the *caudate;* the three first-named being identical with those of the author; the *Spigelian lobe* corresponding with the author's *lobus caudatus* (*Spigeli*), minus the *processus caudatus;* and this latter being the *caudate lobe* of English anatomists.

[17] *Ponticulus Hepatis* (Ibid.).—The inferior vena cava lies in a deep groove on the posterior surface of the liver, the *fissure* or *fossa of the vena cava*. Passing behind the vessel is a strand of fibrous tissue which forms a bridge connecting the right lobe with the Spigelian lobe. It is called by the author **ligamentum venæ cavæ*, but is known in England as the *ponticulus*. Like the **fibrous appendix of the liver* (see note [14] above), it is the remains of a rudimentary lobe, and contains *aberrant vessels*. Not very rarely it consists of perfectly formed hepatic tissue, so that the fissure of the vena cava is converted into a canal.

[18] (Fig. 747, p. 450.) The *gastrosplenic omentum* is connected below with the *great omentum*, and is often regarded as a part of it. With regard to the preference of the name of *omentum* for this structure over the name *ligament*, see Appendix, note [13] above.

[19] *Descriptive Anatomy of the Spleen* (Fig. 746, p. 450).—The author enumerates *three surfaces* only: *phrenic, renal*, and *gastric*. By some anatomists (*e.g.*, Cunningham) the blunt lower and outer end is regarded as a *fourth* surface, the *basal*. This surface lies against the tail of the pancreas, the splenic flexure of the colon, and the costocolic ligament (see note [41] below). In addition to the *anterior* and *posterior borders*, it is usual in England to speak of the ridge just internal to the hilum, which separates the gastric from the renal surface, as the *inner border*.

[20] *Duodenal Folds and Fossæ* (Fig. 757, p. 454).—Two folds of peritoneum usually pass to the left from the front of the ascending portion (fourth part) of the duodenum: one, the lower, with its free edge directed upwards, from the junction of the transverse with the ascending portion of the duodenum; the other, the higher, with its free edge directed downwards, from the duodenojejunal flexure. These are called by the author the *duodenomesocolic* and *duodenojejunal folds*, but it is perhaps better to use the names *inferior* and *superior duodenal folds*. Between these folds, to the right of the ascending portion of the duodenum, is a recess or fossa, called by the author *recessus duodenojejunalis*, the *duodenojejunal fossa*. The extension of this fossa behind the inferior fold is termed the *inferior duodenal fossa;* the extension behind the superior fold the *superior duodenal fossa*. The folds and fossæ in this region are, however, somewhat variable in their disposition. (See Quain's "Anatomy," 10th ed., vol. iii., part iv., p. 326.)

[21] *Peritoneal Fossæ* (Ibid.).—Some authors speak of all the peritoneal *fossæ* as *pouches—e.g., duodenojejunal pouch, subcæcal pouch*. I have not thought it necessary to indicate the alternative name in each individual instance.

[22] *Phrenohepatic Fossa* (Fig. 758, p. 454).—"The *phrenohepatic* or *diaphragmaticohepatic fossa* of the peritoneum is occasionally present on the abdominal surface of the diaphragm. It is an elongated pouch or sinus of varying

dimensions, formed by the partial adhesion of the borders of the fibrous appendix of the liver [see note [14] above] and the left lateral ligament of the liver to the peritoneal investment of the diaphragm" (Von Langer and Toldt's "Anatomy," 7th ed., p. 366).

[23] *Ileocæcal Fossæ* (Fig. 760, p. 455).—These are two in number, *superior* and *inferior*. The *superior ileocæcal fossa* (see Fig. 805, p. 475) is situated in the angle between the ileum and the commencement of the ascending colon; the *inferior ileocæcal fossa* is behind and below the junction of the ileum and the cæcum. It may extend upwards behind the ascending colon nearly as high as the right kidney and duodenum. Its mouth looks downwards and is bounded in front by the ileocæcal fold (*bloodless fold* of Treves). In Fig. 760 a sound is passed into the mouth of this fossa. By some authors the *superior ileocæcal fossa* is termed the *ileocolic fossa*, and in this case the *inferior ileocæcal fossa* is called the *ileocæcal fossa* without qualification.

[24] *Cavum Mediastinale* (Fig. 761, p. 456).—The author divides the mediastinal cavity into two portions only: *cavum mediastinale anterius* and *cavum mediastinale posterius*. English anatomists divide it into four portions: *anterior mediastinum, middle mediastinum, posterior mediastinum,* and *superior mediastinum*. The English *posterior mediastinum* is nearly identical with the author's *cavum mediastinale posterius;* while his *cavum mediastinale anterius* corresponds, with a slight variation, to the three others combined; the *superior mediastinum* being that portion of the cavity above a plane passing from the lower border of the body of the fourth dorsal vertebra to the superior sternal synchondrosis, and thus including the upper portions of both anterior and posterior divisions of the author; the *anterior mediastinum* being the portion of the cavity below the plane above mentioned and in front of the pericardium; and the *middle mediastinum* being the enlarged central portion of the cavity containing the pericardium with its contents, the roots of the lungs, and the bronchial lymphatic glands. (See also note [2] to p. 410.)

[25] (Fig. 765, p. 458.) The *oblique line,* connecting the *superior* and *inferior* tubercles of the thyroid cartilage, is regarded by the author as a variety. Though it varies greatly in prominence, and may be very indistinct, it is seldom entirely absent. Sometimes it is represented by a fibrous band, the *oblique ligament,* stretched between the tubercles. The oblique line or ligament serves for the insertion of the sternothyroid muscle and for the origin of the sternohyoid and thyropharyngeus muscles.

[26] *Arytenoid Cartilage* (Figs. 766 to 768, p. 458).—As several of the terms descriptive of the parts of this cartilage are used neither by Quain nor by Macalister, I quote the following passage from Von Langer and Toldt's "Anatomy," 7th ed., p. 318: "The cartilage consists of an elongated plate, narrowing above to a point, the *apex,* and presenting beneath a thickened, nearly triangular *base*. The anterior border is very sharp, and exhibits just above the middle a small blunt protuberance, the **colliculus,* and at its lower extremity a forwardly directed process for the attachment of the posterior extremity of the vocal cord, hence called the *vocal process*. The concave *articular surface* of the base looks downwards, and exhibits a blunt *muscular process* directed outwards. The *inner surface* is very narrow, and wider below, where it is continued on to the vocal process. The *outer surface* gives attachment to muscles: it presents two hollows, the upper of which, **fovea triangularis,* is a rounded triangle, embraced by a semicircular lip, the **crista arcuata,* which begins above in the colliculus: while the lower, a rounded rectangle, **fovea oblonga,* runs along the base and on to the muscular process, and is separated above from the fovea triangularis by the crista arcuata."

[27] **Corniculopharyngeal Ligament* (Fig. 771, p. 459).—This is a slender strand of fibrous tissue which passes downwards and inwards on each side from the corniculum laryngis or cartilage of Santorini to the mucous membrane of the pharynx. Below these ligaments in the median plane is the **cricopharyngeal ligament,* a flattened band with surfaces laterally directed, attached by its anterior edge to the back of the cricoid cartilage, and by its posterior edge to the mucous membrane of the pharynx. These two ligaments are described neither by Quain nor by Macalister.

[28] (Fig. 770, p. 459.) The *corniculo-arytenoid articulation* is usually, as in this instance, a syndesmosis, but is occasionally a synovial joint.

[29] (Ibid.) This foramen, when present, transmits an abnormal branch of the superior laryngeal artery.

[30] **Conus Elasticus* (Figs. 772, 773, p. 459).—As this term is not found in most English textbooks of anatomy, I quote the following description from Von Langer and Toldt's "Anatomy," pp. 320, 321: "The **membrana elastica tracheæ* [the fibro-elastic membrane in which the tracheal cartilages are embedded] passes upwards into the larynx to form the **membrana elastica laryngis*. First of all it sheathes the inner surface of the cricoid cartilage in its whole extent, but above this it becomes detached from the cartilaginous wall of the larynx, and forms on each side a flat membrane, the only attachments of which to the cartilages are in front to the angle of union of the alæ of the thyroid cartilage, and behind to the vocal processes of the arytenoid cartilage. Thus, the **elastic membrane of the larynx* exhibits two surfaces, converging from each side of the upper border of the cricoid cartilage upwards towards the median plane, and at the level of the vocal processes terminating in two parallel free borders. This arrangement of the elastic membrane is known as the **conus elasticus,* and the somewhat thickened free borders are called **ligamenta vocalia* [the inferior thyro-arytenoid ligaments or ligaments of the true vocal cords]. At this level the **elastic membrane of the larynx* terminates, being replaced above by a thin layer of areolar tissue. That portion of the **elastic cone* which connects the upper border of the front of the cricoid cartilage with the lower border of the front of the thyroid cartilage is seen from the front as a triangular membrane filling in the gap between the two cartilages, and is called the *middle cricothyroid ligament* [middle portion of the cricothyroid membrane]." This description appears alike more intelligible and more accurate than that given in most English textbooks, which is to the effect that the vocal cord may be regarded as the upper free edge of the cricothyroid membrane.

[31] *Mucous Glands of the Larynx* (Figs. 775, 777, p. 460).—The names used by Toldt—*anterior, middle,* and *posterior laryngeal glands*—are not commonly employed by English anatomists. The *anterior* glands, situate on the back of the epiglottis, I have called the *post-epiglottic glands*. The *middle* glands, most numerous above, where they form a prominence beneath the mucous membrane of the aryteno-epiglottic fold immediately behind the cartilage of Wrisberg, and a chain running thence downwards and forwards along the false vocal cord, may be best distinguished as the *glands of the aryteno-epiglottic fold*. The *posterior* glands form a mass behind the arytenoid cartilage and beneath the cartilage of Santorini, and may be called *post-arytenoid glands*. All these must be carefully distinguished from the so-called *epiglottic gland* between the anterior surface of the epiglottis, the hyoid bone,

and the root of the tongue, which is not a gland at all, but a mass of yellow fat and fibrous tissue. (See *periglottis* in Fig. 675, p. 420, and note [2] above.)

[32] *Labium Vocale* (Fig. 779, p. 461).—The true vocal cords, writes Quain ("Anatomy," 10th ed., vol. iii., part iv., p. 155), "are situated at the inner and free edge of a mass of tissue triangular on coronal section [see Fig. 780]. One surface of this mass looks upwards, and forms the floor of the ventricle; another looks downwards and inwards, and bounds the lower division of the laryngeal cavity; while the third is external." This triangular mass constitutes the author's *labium vocale,* or, as it may be called, the **lip of the glottis,* but the term is not current in England.

[33] *Macula Flava, the Cartilage of Luschka* (Fig. 781, p. 461).—"In the anterior part of the vocal cord, near its attachment to the thyroid cartilage, there is a circumscribed mass of dense elastic tissue containing numerous cells. This is visible through the intact mucous membrane as a *yellow spot* (*macula flava*), of about the size of a poppy-seed" (Von Langer and Toldt's "Anatomy," 7th ed., p. 323). "A small nodule of elastic cartilage (*cartilage of Luschka*) is found in the anterior and inferior part of the vocal cord" (Quain's "Anatomy," 10th ed., vol. iii., part iii., p. 155).

[34] *Tunica Adventitia Pharyngis* (Fig. 791, p. 466).—"The outermost layer of the wall of the pharynx consists of a thin stratum of connective tissue, the *tunica adventitia pharyngis,* which forms a fascial covering for the constrictor muscles of the pharynx, and may be regarded as a continuation of the bucco-pharyngeal fascia. It is of importance for the reason that the primary ramification of the vessels and nerves of the pharynx takes place in its substance. In the middle line behind it is connected with the *raphe of the pharynx,* and above with the *fascia pharyngobasilaris* [the *pharyngeal aponeurosis* of English authors; see pp. 432, 433, and 436] . . . which (with the mucous membrane) alone forms the uppermost portion of the posterior and lateral walls of the pharynx, the muscular coat being here deficient, as the superior constrictor of the pharynx does not extend up to the base of the skull" (Von Langer and Toldt, *op. cit.,* p. 305). The outer fibrous coat of the pharynx thus separates the constrictor muscles from the prevertebral fascia. On either side it is attached to the sheath of the great vessels of the neck. It is most strongly developed behind and (above) at the sides, and this portion is called by Macalister the *post-pharyngeal fascia,* which name I have given in the text as an alternative, the name *adventitious coat of the pharynx* not being used by English anatomists.

[35] *Broncho-œsophageus and Pleuro-œsophageus Muscles* (Fig. 799, p. 470).—"The longitudinal fibres of the œsophagus are sometimes joined by a broad band of smooth muscle, passing from the left pleura, and sometimes also by another from the left bronchus. According to Cunningham, the former is almost constantly present, and the latter very frequently" (Quain's "Anatomy," 10th ed., vol. iii., part iv., p. 66).

[36] *Supplemental Pleural Spaces* (Ibid.).—The use of the term *sinus* for those regions of the pleural cavity in which two portions of parietal pleura are in apposition appears inappropriate. Quain suggests the preferable name of *supplemental* or *complemental pleural space.* There are three such regions in which the pleural cavity is unoccupied by lung: the *phrenocostal* (shown in Fig. 799), between the chest wall and the diaphragm, below the inferior border of the lung; the *pericardiosternal* or *costomediastinal* (shown in Figs. 800 and 801, p. 471), between the anterior surface of the pericardium and the posterior surface of the sternum and costal cartilages, internal to the anterior border of the lung, and more extensive on the left side than on the right; and the *mediastinodiaphragmatic* (Macalister) or *pericardiophrenic,* between the lower margin of the pericardium and the diaphragm.

[37] (Ibid.) The *crura* or *pillars* of the diaphragm described by English anatomists are two only in number—a longer *right* crus and a shorter *left* crus. Each of these is composed of all the fibres passing from the right and left sides, respectively, of the bodies of the lumbar vertebræ and the intervertebral discs to the central tendon. Thus, the *crus* of English authors corresponds to the combined *inner* crus and *intermediate* crus of Toldt; while the *outer* crus of the latter is in England not considered to belong to the crural portions of the diaphragm.

[38] *Bulb of the Aorta* (Fig. 800, p. 471).—This name is often given to the somewhat enlarged portion of the *ascending aorta* immediately above the aortic valve, which contains the three *sinuses of Valsalva.*

[39] *Ascending Mesocolon* (Fig. 805, p. 475).—Fig. 756, on p. 453, shows an abnormal condition of the large intestine in which the posterior layer of the ascending mesocolon has failed to become adherent to the parietal peritoneum, and the ascending colon, like the transverse colon, is freely movable. Normally, however, as shown in Fig. 805, this adhesion takes place, and a strip of the posterior surface of the ascending colon is connected by areolar tissue with the fascia covering the quadratus lumborum muscle, and with the front of the right kidney. To call the adherent layer of peritoneum internal to the ascending colon by the name of *ascending mesocolon* is contrary to English usage. See also note [1] to p. 453.)

[40] **Gastrocolic Ligament* (Fig. 806, p. 476).—This name is given by the author to that part of the *great* or *gastrocolic omentum* which connects the great curvature of the stomach with the transverse colon.

[41] *Saccus Lienalis* (Fig. 807, p. 477).—A fold of peritoneum, the *costocolic* or *phrenocolic ligament,* or *pleurocolic fold,* attached externally to the diaphragm opposite the tenth and eleventh ribs, passes horizontally inwards to the splenic flexure of the colon. It has a lunated free border directed forwards. It forms the lower boundary of a hollow containing the spleen; the basal surface of this organ (see note [19] above) resting upon the ligament as on a shelf (see also Fig. 813, p. 483. Hence this ligament, though not attached to the spleen, is sometimes called *sustentaculum lienis,* while the hollow above is called by the author *saccus lienalis—the splenic pouch.* This must be carefully distinguished from the **splenic fossa of the omental sac.* See Fig. 809, p. 479, and note [44] below.

[42] *Parts of the Small Omentum* (Ibid.).—The *small omentum* consists of the following portions, enumerated in their position from left to right: (1) a *thick* portion (*pars condensa omenti minoris*), passing to the cardia; (2) a *thin* portion (*pars flaccida omenti minoris*), passing to the lesser curvature—these form the gastrohepatic omentum proper; (3) a thicker portion again, passing from the transverse or portal fissure of the liver to the pylorus and the first part of the duodenum, with a free border directed to the right, forming the anterior boundary of the foramen of Winslow, and containing between its layers the hepatic artery, portal vein, common bile-duct, and nerves and lymphatics of the liver (this portion of the small omentum is called by the author the *hepatoduodenal ligament,* but the term is not used by English anatomists). In the specimen shown in Fig. 807 the small omentum extends abnormally far to the left, to form a *hepatocolic ligament* or *omentum.*

[43] *Superior Mediastinum* (Fig. 809, p. 479).—The lower margin of the cut surface of the aorta in this figure is at the level of the plane separating the *superior mediastinum* of English authors from the three lower divisions of the mediastinal cavity. See note [2] to p. 410 and note [24] above.

[44] *Divisions of the Omental Sac* (Ibid.).—"The omental sac is attached to the posterior abdominal wall in the median line in front of the aorta by the root of the mesogastrium. Here also is the boundary of the principal part of the cavity and the orifice giving access from the right to its interior. The boundary is constituted by a fold of peritoneum, the *pancreaticogastric fold,* which extends from the superior border of the pancreas vertically upwards along the line of attachment of the mesogastrium to the cardia of the stomach; between the layers of this fold the coronary artery runs from the cœliac axis to the small curvature of the stomach. The pancreaticogastric fold forms the boundary between the principal part of the omental sac and the cavity situated behind the small omentum, and known as the *vestibule of the omental sac.* Regarding that portion of the omental sac which lies behind the stomach as the principal or middle portion of the cavity, we can distinguish three supplementary compartments: the largest of these extends downwards below the stomach between the two layers of the great omentum, and is called *recessus inferior omentalis,* the *inferior fossa of the omental sac;* the second lies behind the gastrosplenic omentum, and is bounded on the left by the hilum of the spleen—this is known as *recessus lienalis,* the *splenic fossa of the omental sac;* the third, finally, stretches upwards, close to the abdominal portion of the œsophagus, and is termed *recessus superior omentalis,* the *superior fossa of the omental sac*" (Von Langer and Toldt's "Anatomy," p. 357). I have given this long extract because the omental sac is not adequately described in Quain's "Anatomy." Macalister, who treats the subject more fully and accurately, describes the omental pouch [sac] as "hour-glass-shaped," and terms the opening between the two sections, bounded behind by the pancreaticogastric fold, the *mesomental opening.* The part of the sac to the right of this opening, and between it and the foramen of Winslow, he calls the *lesser omental sac,* which comprises the combined superior fossa and vestibule of the omental sac of Toldt. The *splenic fossa of the omental sac* is to be carefully distinguished from the *splenic pouch* of the greater peritoneal cavity, the two being separated by the gastrosplenic omentum. See Fig. 807, p. 477, and note [41] above.

[45] (Ibid.) The *gastrosplenic omentum* is connected below with the great omentum, and is often regarded as a part of it. The name "omentum" is to be preferred to "ligament" for this structure (see note [13] above).

[46] (Fig. 816, p. 486.) The *sternal line* is a vertical line traced on the front of the trunk passing over the sterno-clavicular articulation.

[47] (Ibid.) The *parasternal line* is a vertical line traced on the front of the trunk midway between the sternal line and the mamillary line.

[48] (Ibid.) The *mamillary line* is a vertical line traced on the front of the trunk passing through the centre of the nipple or mamilla. "When the mammæ are pendulous, the mamillary line may be taken as corresponding to the perpendicular dropped from the middle of the clavicle" (Macalister).

[49] (Fig. 818, p. 488.) The *axillary line* is a vertical line traced on the side of the trunk passing through the anterior fold of the axilla (Macalister), or through the summit of the axillary fossa (Toldt). It will be seen that the axillary line as defined by Macalister is a little behind the axillary line as defined by Toldt. The latter line is, of course, the one shown in the figure.

[50] *Calices and Infundibula* (Figs. 823 to 825, p. 491).—Quain writes: "The pelvis, within the sinus, divides usually into three, but sometimes only two, primary tubular divisions, and these at length end in a large number of short, truncated, but comparatively wide branches named *calices* or *infundibula,* which receive the papillæ into their wide mouths. . . . A single calix often surrounds two, sometimes even three, papillæ, which are in that case united together; hence the calices are in general not so numerous as the papillæ" ("Anatomy," 10th ed., vol. iii., part iv., p. 193). The author, it will be noticed, calls the primary divisions of the pelvis *calyces majores;* the secondary and terminal divisions, *calyces minores.* Macalister, whose usage I have followed, discriminates between infundibula and calices, applying the former name to the primary, the latter to the secondary divisions of the pelvis. Toldt and Macalister alike state that there is a calix for each papilla; but Quain's description is the more accurate. The calices usually number from eight to twelve, the papillæ from twelve to twenty.

[51] *Area Cribrosa* (Fig. 827, p. 492).—"At the summit of each pyramid the *ductus papillares*—the *uriniferous* or *excretory tubules,* or *ducts of Bellini*—five to fifteen in number, open by as many separate orifices. The area of the papilla containing these orifices (*foramina papillaria*), which are almost distinguishable by the naked eye, is known as the **area cribrosa*" (Von Langer and Toldt's "Anatomy," 10th ed., p. 370). A number of the orifices are often aggregated at the bottom of a slight depression near the summit of the papilla. This depression, when present, is termed the *foveola.*

[52] (Fig. 831, p. 492.) Quain's nomenclature of the surfaces of the suprarenal capsules differs somewhat from that of Toldt. According to the former authority, the *posterior surface* of the *left capsule* "is divided into two parts by a prominent vertical ridge, the area mesial to the ridge looking inwards and backwards and resting upon the left crus of the diaphragm, and the lateral area outwards as well as backwards against the kidney" ("Anatomy," 10th ed., vol. iii., part iv., p. 303). The *mesial* of these two areas is the *facies posterior* of Toldt; the *lateral* is named by him basis glandulæ suprarenalis. Similarly in the case of the *right capsule,* the *posterior surface,* according to Quain, consists of two areas: one, the upper and larger, in contact with the diaphragm, being identical with the *facies posterior* of Toldt; the other, lower and smaller, in contact with the kidney, called by Toldt the *basis.* This aspect of the right capsule is, however, not shown in the Atlas.

[53] (Fig. 835, p. 493.) The portion of the uriniferous tubule between the peripheral extremity of Henle's looped tubule and the commencement of the collecting tubule, called in Germany the *Schaltstück* (intermediate portion), "because it is, in a sense, intermediate between the secretory and the excretory portion of the tubule" (Toldt), comprehends the *irregular or zigzag tubule,* the *second convoluted tubule,* and the *junctional tubule,* of English authors.

[54] (Ibid.) This comprises the *descending tubule of Henle,* the *loop of Henle,* and the *ascending tubule of Henle,* of English authors.

[55] (Ibid.) The term *straight tubule,* as used by the author, includes all the tubules forming part of the pyramids and the medullary rays, whether these are *descending* and *ascending tubules of Henle, collecting tubules,* or *ducts of Bellini.*

[56] *Blood-Supply of the Medulla of the Kidney* (Ibid.).—It will be noticed that I have written "*pseudarteriæ rectæ, or vasa recta spuria*" as the counterpart in the English nomen-

clature of the author's "*arteriolæ rectæ*." There is, in fact, a conflict of opinion regarding the blood-supply of the medulla of the kidney. In Von Langer and Toldt's "Anatomy," 7th ed., p. 373, we find the following views expressed: "An important problem, with regard to the blood-supply of the kidney, is whether all the blood circulating in that organ, the medulla as well as the cortex, must necessarily pass through the glomeruli; for if this be so, the nutrition of the medulla is dependent on the vessels of the cortex. It is an established fact that the efferent vessels of the large glomeruli adjacent to the medulla break up into leashes of straight vessels, *arteriolæ rectæ,* which are continued into the capillary plexus of the pyramids of Malpighi. The question arises, whether, in addition to these vessels proceeding from the glomeruli, other arterioles, directly derived from the arterial arches, supply this capillary plexus. We may answer with considerable confidence that, even if such a direct arterial blood-supply to the pyramids exists, the blood thus conveyed would be insufficient in quantity, and that the nutrition of the pyramids is, in any case, dependent to a notable extent upon the blood-vessels of the cortex." Quain, on the other hand, writes ("Anatomy," 10th ed., vol. iii., part iv., p. 202): "The efferent vessels from the lowermost glomeruli break up wholly into pencils of straight vessels (*pseudarteriæ rectæ*), which pass directly into the boundary layer of the medulla, and there supply the continuation downwards of the medullary rays into the pyramid. . . . With the exception of the blood brought by the false arteriæ rectæ, the blood-supply of the medulla is to a great extent independent of that of the cortex, although, of course, the capillary network is continuous throughout. The pyramids are chiefly provided with blood by branches which come off directly from the concave side of the arterial arches, and passing down into the boundary layer of the medulla there divide to form bunches or pencils of parallel or slightly diverging minute vessels (*arteriæ rectæ*), which, by alternating with the bundles of uriniferous tubules which are passing up to the cortex to form the medullary rays, produce the characteristic streaked appearance of this part of the pyramid." To sum up: In Toldt's view the blood-supply of the medulla is principally dependent on that of the cortex, and the existence of a direct blood-supply to the medulla must even be regarded as doubtful; whereas, according to Quain, though the existence of a cortical element in the blood-supply of the medulla (by means of the false arteriæ rectæ) is admitted to be "an established fact," the direct element in the blood-supply of the medulla (by means of the true arteriæ rectæ) must be regarded as having considerably greater importance. Other English authorities—Foster, Halliburton, and Macalister—are in agreement on this question with the views of Schäfer and Symington as set forth in Quain's "Anatomy." Foster, indeed, lays especial stress, from the physiological point of view, on the fact that "the blood-supply of the pyramids, consisting chiefly of conducting tubules, is to a very large extent distinct from that of the cortex, where the tubules are chiefly secreting tubules" ("Physiology," 5th ed., p. 665). Macalister calls the *true* arteriæ rectæ *recurrent straight branches,* or *vasa recta vera;* and the *false* arteriæ rectæ *vasa recta spuria.*

[57] (Fig. 836, p. 494.) "The *iliacosubfascial fossa* is a roomy recess or pouch of the peritoneum met with as a very rare variety in the inner part of the iliac fossa. When present, it is formed in the following manner: The tendon of the psoas parvus muscle, as it passes to its insertion into the iliac fascia covering the iliopectineal line and eminence, separates a little from the iliacus muscle, forming a hollow, which extends for a certain distance inwards behind the psoas magnus muscle. The parietal peritoneum, as it coats the interior of this hollow, necessarily forms a peritoneal recess or pouch, and this recess, if, as usually when present, it is on the left side, is occupied by the lowermost portion of the descending colon" (Von Langer and Toldt's "Anatomy," 7th ed., p. 466).

[58] *Cervix or Neck of the Bladder* (Fig. 839, p. 496).—This name is given by English anatomists to that portion of the bladder immediately in front of the base, at the junction of the organ with the urethra. The term is not used by Toldt. Other terms employed by English anatomists and not by the author, in describing the bladder, are given in note [61] below.

[59] **Tendinous Arch of the Pelvic Fascia* (Figs. 840, 841, p. 497).—"The origin of the *visceral layer of the pelvic fascia* and of the *rectal* and *anal fasciæ* (see note [106] below) from the parietal layer of the pelvic fascia or obturator fascia takes place along a tendinous band that runs across the lateral wall of the pelvis, the *arcus tendineus fasciæ pelvis.* This is seen as soon as the parietal peritoneum and the delicate subserous areolar tissue have been removed. It begins in front behind the pubic symphysis, at the level of the inferior pubic or subpubic ligament, runs backwards, crossing the upper part of the levator ani muscle about an inch below the obturator canal, towards the spine of the ischium, and can be traced yet further backwards, though thinner and less defined, on the surface of the coccygeus muscle, and as far as the fourth sacral vertebra. The foremost portion of this tendinous arch, which has a well-defined edge, is called *ligamentum puboprostaticum* (*pubovesicale*) *medium*—the anterior true ligament of the bladder, or puboprostatic ligament; this ligament, with its fellow, bounds a deep hollow behind the symphysis, *fovea pubovesicalis*—the *pubovesical fossa—at the bottom of which the dorsal vein of the penis is seen entering the pelvis and dividing into two lateral branches. . . . Flattened bands of fibrous tissue, reinforcing the pelvic fascia, and radiating from the tendinous arch upwards near the entrance of the obturator canal (often, however, but slightly developed), receive the name of *ligamentum puboprostaticum* (*pubovesicale*) *laterale*—the lateral true ligament of the bladder" (see Fig. 924, p. 533).—Von Langer and Toldt's "Anatomy," 7th ed., pp. 444, 445. This passage shows that Toldt's *arcus tendineus fasciæ pelvis* corresponds with the *white line of the pelvic fascia* of English authors; but also that the former term is used in a more comprehensive sense that the latter.

[60] *Pubovesical Muscle* (Fig. 840, p. 497).—See Quain's "Anatomy," 10th ed., vol. iii., part iv., p. 213, and Macalister's "Anatomy," p. 447. By the latter authority these unstriated muscular fibres connecting the anterior wall of the bladder with the back of the pubis and with the prostate gland (in the male) are called *puboprostaticovesical fibres.*

[61] *Boundaries of the Trigone of the Bladder* (Figs. 842, 843, p. 498).—The base or posterior boundary of the trigone is formed by a curved elevation of varying prominence connecting the summits of the ureteric orifices, and known as *Mercier's bar;* it corresponds in position with a muscular band which joins these orifices to one another and to the neck of the bladder. At its outer extremities Mercier's bar is continuous with the *ureteric folds,* above and outside the ureteric orifices; these folds are supposed to act as valves preventing the regurgitation of urine into the urethra. The ureteric folds are continued downwards by the lateral boundaries of the trigone, two faint ridges which converge to the lower extremity of the uvula of the bladder and the back of the urethral orifice. These ridges correspond, like Mercier's bar, to muscular bands, which in this case, however, belong to the internal layer of longitudinal fibres, and they are known as

Bell's muscles. Behind Mercier's bar there is often, especially in old age, a depressed area, the *post-trigonal pouch.*

[62] **Urethral Ring* (Fig. 842, p. 498).—"The internal orifice of the urethra, *orificium urethræ internum*, is seen, in the contracted bladder, to be surrounded by a circular elevation of the mucous membrane, *annulus urethralis*, dependent on the great development in this region of the circular layer of the muscular coat. When the bladder is greatly distended, the urethral ring is hardly discernible" (Von Langer and Toldt's "Anatomy," 7th ed., p. 376). This is the *sphincter vesicæ* (*internus*) of some authors. Griffiths states there is no thickening of the circular fibres in this situation sufficient to justify the use of the term sphincter ("Observations on the Urinary Bladder and Urethra," *Journal of Anatomy and Physiology*, 1891). These fibres at the *base* of the prostate are called by Macalister *sphincter vesicæ internus* to distinguish them from an envelope of striated muscle fibres surrounding the urethra at the *apex* of the prostate, and called by Macalister *sphincter vesicæ externus.*

[63] (Ibid.) Toldt distinguishes the *colliculus seminalis* as the middle thickened section of the *crest of the urethra*, in which the prostatic utricle opens. In England, however, the names *colliculus seminalis, verumontanum,* and *caput gallinaginis*, are commonly employed as alternative names for the whole length of the *crest of the urethra.*

[64] (Ibid.) Known also as the *prostatic sinus, prostatic vesicle, sinus pocularis,* and *uterus masculinus.*

[65] **Crest of the Female Urethra* (Fig. 843, p. 498).—"The mucous membrane of the female urethra exhibits in the median line of the posterior wall a longitudinal prominence, *crista urethralis*, which can be traced from the internal to the external orifice" (Von Langer and Toldt's "Anatomy," 7th ed., p. 409). This is the most prominent of several longitudinal folds in the female urethra. It is mentioned by Quain and Macalister, but not named.

[66] (Fig. 845, p. 500.) Known also as *Duverney's gland*, or the *suburethral gland.* The latter name, though suitably applied to Cowper's gland, is given to Bartholin's gland only on the ground of its homology with Cowper's gland.

[67] *Os Uteri Externum* (Ibid.).—This is commonly spoken of by clinicians as the *os uteri*, without qualification, though the word *externum* is properly added to distinguish it from the *os uteri internum.* The external os was in former times called the *os tincæ*, from its supposed resemblance to the mouth of a tench.

[68] **Fascial Coverings of the Testicle and Spermatic Cord* (Figs. 846, 847, p. 501).—The names given to these are various and conflicting. According to the best-established nomenclature of English anatomists, the covering derived from the intercolumnar fibres of the external oblique muscle of the abdomen is called the *intercolumnar* or *spermatic fascia.* Next within this comes the cremaster muscle and the aponeurotic layer connecting its fibres, to which, considered as a whole, Quain gives the name of *cremasteric fascia.* Thirdly, within this, we come to the covering derived from the transversalis fascia, and generally known in England as the *infundibuliform fascia.* But the divergencies from the nomenclature just given are manifold. Taking Toldt first, we find he gives the name of *fascia cremasterica* (*Cooperi*) to the *intercolumnar* or *spermatic fascia* of English anatomists; and the name of *tunica vaginalis communis testis et funiculi spermati* to the infundibuliform fascia of English anatomists. (In England the use of the term *tunica vaginalis* is entirely restricted to the serous sac of the testicle.) Macalister further complicates the use of the term *cremasteric* by describing as the *tunica cremasterica, all three* of the fascial layers enumerated at the beginning of this note, "which are so closely united as to be with difficulty separable from each other." It will be noted that Toldt appends the name of Astley Cooper to the layer he terms "cremasteric," but this is a further divergence from English usage. By the term *fascia propria of Astley Cooper* we denote, in England, the penultimate covering of an oblique inguinal hernia, that next to the peritoneum, which consists of the combined infundibuliform fascia and the subserous areolar tissue between that fascia and the peritoneum. As a final alternative in the nomenclature of the fascial layers in this region, I give that of Young (U.S.), who enumerates the coverings of the cord as consisting of (1) *external spermatic* or *intercolumnar fascia*, (2) *cremaster muscle, and* (3) *internal spermatic fascia* or *fascia propria.* From this medley, the student will do well to select and impress on his memory the distinctive names of *intercolumnar fascia, cremasteric fascia,* and *infundibuliform fascia.*

[69] *Hydatids of Morgagni* (Fig. 848, p. 502).—"On the upper extremity of the testis and beneath the head or globus major of the epididymis is situated a hemispherical body of varying size, consisting of delicate and very vascular connective tissue, and often containing the remnant of a duct. This is known as the *sessile hydatid of Morgagni*, or *appendix testis* (*Morgagnii*), and is the rudiment of the cephalic extremity of the fœtal Müllerian duct. Similar but smaller stalked bodies are frequently met with on the head or globus major of the epididymis, and are termed *pedunculated hydatids, appendices epididymidis*" (Von Langer and Toldt's "Anatomy," pp. 383, 384). The terms *sessile* and *pedunculated hydatid* are employed by Macalister, but not by Quain; the latter authority uses *appendix of the testicle* as an alternative name for the (*sessile*) *hydatid of Morgagni.* Some authorities call it *corpus Morgagni.* For the development of these structures from Müller's duct, see Figs. 896, 897, p. 520.

[70] **Ligaments of the Epididymis* (Fig. 849, p. 502).—The epididymis is attached to the posterior border of the testicle (1) by the efferent ducts passing from the gland to the head or globus major of the epididymis; (2) by a duplicature of the tunica vaginalis containing numerous bloodvessels passing between the testicle and the posterior border of the epididymis; (3) within the digital fossa (sinus epididymidis) are two strands of fibrous tissue covered by reflections of the tunica vaginalis connecting the upper and lower ends respectively of the body of the epididymis with the testicle. It is these last that are called by the author **superior* and *inferior ligaments of the epididymis.* The names are not used by Quain or Macalister.

[71] *Vas Aberrans* (Fig. 851, p. 502).—"The so-called *ductulus aberrans* is a tube with a blind termination, which opens by its proximal extremity into the canal of the epididymis near the tail of that organ. Coiled tightly, it forms a small lobe not attached to the testicle proper; but occasionally also it is seen as a straight tube of varying length. It is a glandular canal, and represents that part of the Wolffian body which was not used up in the formation of the head or globus major of the epididymis. A similar canal, *ductulus aberrans superior*, is sometimes met with attached to the head or globus major of the epididymis. This, however, is attached to the testicle, and is merely an efferent duct which has become strictured off from the canal of the epididymis, and has thus lost its connexion with the head of that organ" (Von Langer and Toldt's "Anatomy," 7th ed., p. 383).

[72] *Lobes or Lobules of the Epididymis* (Fig. 854, p. 503).

—Toldt by this term denotes the coils of the various efferent ducts of the testicle. These, however, form the *coni vasculosi* of English anatomists, who use the term *lobes of the epididymis* to denote the larger masses of the coiled *canal of the epididymis,* these lobes or masses being separated by incomplete transverse fibrous partitions.

[73] *Middle Lobe or Isthmus of the Prostate Gland* (Fig. 858, p. 504).—This is that portion of the prostate gland lying between the ejaculatory ducts and the neck of the bladder; its forward projection lies beneath the uvula of the bladder. The term *isthmus,* though not commonly employed in England, is preferable to *middle lobe,* for it is only in pathological senile enlargement of the prostate that the organ becomes distinctly trilobate. The middle lobe of the prostate gland is sometimes also known as *Home's lobe.*

[74] (Fig. 861, p. 505.) The outer fibrous coat of the prostate gland is derived in part from the visceral layer of the pelvic fascia and the deep layer of the triangular ligament of the urethra, and in part from a dense but thin fibrous layer peculiar to the prostate beneath the outer fascial investment. To the compound fibrous coat thus formed Macalister gives the name of *pelviprostatic capsule,* expressing its joint origin. The *prostatic plexus of veins* ramifies between the two layers of this capsule; and immediately beneath the inner layer is the external layer of unstriated muscular fibres to which Toldt gives the name of *musculus prostaticus.*

[75] *Divisions of the Cervix* (Fig. 873, p. 511).—Most authorities are in agreement with the author in his division of the cervix uteri into two parts only—*vaginal* and *supravaginal.* Schroeder, however, speaks of three portions—*infravaginal, intermediate,* and *supravaginal.* (See Hart and Barbour's "Gynecology," 3rd ed., pp. 16, 17.)

[76] (Figs. 873, 874, p. 511.) The *mesovarium,* or *mesentery of the ovary,* is the bilaminar fold of peritoneum by which the ovary is attached to the broad ligament of the uterus. (See also note [82] below.)

[77] *Position of the Ovary* (Fig. 873, p. 511).—Owing to the manner in which the broad ligament has been drawn out to its full length, the ovary has been pulled into a horizontal position, differing from that it normally occupies in the body, in which, according to some authorities, its long axis is oblique, according to others, vertical. Hence *in situ* the *tubal* extremity becomes *superior;* the uterine extremity *inferior;* and the surfaces, here represented as directed upwards and downwards, become *external* and *internal.*

[78] *Vaginal Fornix* (Figs. 873, 874, p. 511).—This is the upper portion of the vagina, surrounding the vaginal portion of the cervix. Most English anatomists, however, speak, not of the vaginal fornix as a whole, but of its four parts: *anterior fornix, posterior fornix,* and *right* and *left lateral fornices.*

[79] *Bursa Ovarica* (Fig. 874, p. 511).—This term is not used by Quain. Macalister describes it as a pouch at the back of the broad ligament of the uterus in which the ovary lies, between the *ovariopelvic ligament* (*ligamentum suspensorium ovarii,* according to Toldt's nomenclature—see also note [8], p. 511) and the rest of the broad ligament. The *ovarian bursa* must be distinguished from the *ovarian fossa* or *fovea* (*fossa ovarii,* Quain), which is a recess in the parietal peritoneum on the lateral wall of the pelvis, corresponding to the external surface of the ovary, and situated between the external and internal iliac arteries in front of the sacro-iliac articulation; the ovarian fossa is often bounded behind and below by the ureter.

[80] (Fig. 875, p. 512.) Owing to the irregular, torn appearance of the *fimbriated extremity* of the Fallopian tube, surrounding the abdominal orifice, this orifice was by ancient anatomists named *morsus diaboli.*

[81] (Ibid.) English anatomists usually speak of separate *uterine* and *vaginal* venous plexuses. These, of course, communicate somewhat freely; but on the whole the venous blood from the body of the uterus passes by means of the uterine plexus to the ovarian or pampiniform plexus and the inferior vena cava, that from the neck of the uterus and the vagina by means of the vaginal plexus to the internal iliac vein.

[82] *Mesometrium, Mesovarium, and Mesosalpinx* (Figs. 875, 876, p. 512).—As these terms are not employed by all English authorities, I append a description from Von Langer and Toldt's "Anatomy," 7th ed., p. 401: "That portion of the broad ligament of the uterus which passes to the lateral wall of the pelvis, there to become continuous with the parietal layer of the peritoneum, conveys the vessels and nerves and the round ligament to the uterus, and is therefore called the *mesentery of the uterus* or *mesometrium;* that part of the broad ligament which lies between the ligament of the ovary and the Fallopian tube, sometimes rising above the plain of the pelvic inlet, and terminating laterally in a free border (the *infundibulo-ovarian border*) is the *mesentery of the Fallopian tube,* or *mesosalpinx;* and from this there branches off backwards the short *mesentery of the ovary,* or *mesovarium.*" See Fig. 876.)

[83] **Corpus Albicans* (Fig. 876, p. 512).—This name is given to the white, stellate mass of scar tissue into which the *corpus luteum* is ultimately transformed.

[84] *Parametrium* (Fig. 881, p. 513).—This name was first given by Virchow (*Archives,* No. xxiii.) to that part of the subserous connective tissue of the pelvis, abundantly supplied with bloodvessels and lymphatics, that lies beside the cervix and the upper part of the vagina, and between the layers of the broad ligament of the uterus at its lower and inner part. The term *parametrium* is rather a clinical than an anatomical one, and since, as Spiegelberg points out ("Midwifery," Eng. ed., vol. i., p. 431) the name conveys the idea of a definite organ whilst there is no line of demarcation between the parametric and the paravaginal, paravesical, and pararectal tissue, the name *parametric connective tissue* is to be preferred.

[85] (Ibid.) The *anal fascia* is continued in front into what is called (in the male) the *deep* or *superior layer* of the *triangular ligament of the urethra,* and by Macalister called the *subpubic fascia.* The name *anal fascia* is limited to that part which forms the inner wall of the ischiorectal fossa.

[86] *Rectal Fascia* (Ibid.).—This appears to be the most suitable English equivalent for the author's *fascia diaphragmatis pelvis superior,* the fascia covering the upper surface of the levator ani muscle.

[87] *Pelvic Diaphragm* (Ibid.).—In this the author includes, in addition to the *coccygeus* or *levator coccygis* and *levator ani* muscles, the *superior* and *inferior fasciæ of the pelvic diaphragm—i.e.,* the *rectal* and *anal fasciæ* of English anatomists. (See also notes [85] and [86].)

[88] (Fig. 883, p. 514.) *Skene's tubules* (*ductus paraurethrales*) are two canals running parallel with the female urethra on either side, beneath the mucous membrane and embedded in the muscular coat. They open either just within or just without the urethral orifice (within, probably, in the virgin, and without, in the multipara, in whom slight eversion of the urethral orifice is almost constant). Their diameter is about 1 millimetre ($\frac{1}{25}$ inch), and their length from $1\frac{1}{2}$ to 3 centimetres ($\frac{1}{2}$ inch to $1\frac{1}{4}$ inches), but they never extend beyond the internal orifice of the urethra. Though not distinctly glandular in character, they are often called *Skene's glands.*

They were first described by Skene in the *American Journal of Obstetrics* for April, 1880. A third tubule, *Schüller's tubule,* is occasionally present in the middle line behind, midway between Skene's tubules.

[89] *Vestibule* (Ibid.).—Toldt includes in this the space at the sides of the vaginal orifice within the edges of the labia minora, as well as the space in front of that orifice. As defined by English anatomists, however, the *vestibule* is the triangular space of which the clitoris forms the apex, the labia minora the sides, and a transverse line through the front of the vaginal orifice the base.

[90] *Fossa Navicularis* (Ibid.).—Macalister stands alone in applying this term to the space *behind* the fourchette, between that fold and the posterior commissure of the vulva. By all other authorities the fossa navicularis is defined as the space in *front* of the fourchette, between it and the posterior margin of the vaginal orifice.

[91] *Bulbus Vestibuli* (Figs. 884, 885, p. 515).—Though this mass of erectile tissue is commonly known in England as the *bulb of the vestibule,* the use of this term is altogether inconsistent, since it is only the partially detached anterior portion (*pars intermedia* of Kobelt) that lies in the region of the vestibule as defined by English anatomists (see note [89] above). Hence the alternative name of *vaginal bulb* is to be preferred.

[92] (Fig. 884, p. 515.) This *venous plexus* is the lower part of the vaginal plexus, which communicates freely behind with the lower part of the hæmorrhoidal plexus.

[93] *Marginal Lip of the Cloaca* (Fig. 895, p. 520).—The name of *cutaneous fold* or *greater cutaneous fold* is sometimes given to this structure, which forms the scrotum in the male and the labia majora in the female. To avoid confusion, however, it is better to speak of it as the *marginal lip,* and to reserve the name *fold* for the *genital folds* (see Figs. 908-911, p. 524), which develop on each side within the marginal lip, and form in the male (by their fusion in the median line) the floor of the penile urethra, in the female the labia minora or nymphæ.

[94] *Cloaca* (Ibid.).—We must distinguish between the *cloaca,* which is the cavity formed by the united distal extremities of the alimentary and urogenital canals, and the *cloacal orifice,* by which the cloaca opens externally.

[95] *Ligaments of the Wolffian Body* (Figs. 898 and 899, p. 521).—A strand of fibrous tissue mixed with involuntary muscular fibres is attached to each end of the Wolffian body, the upper passing to the diaphragm, the lower to the groin. These are called *superior* and *inferior,* or *diaphragmatic* and *inguinal ligaments of the Wolffian body;* the inferior or inguinal ligament in England is, however, usually known as the *plica gubernatrix.* As the Wolffian body becomes atrophied, the superior or diaphragmatic ligament disappears; but concurrently with the development of the genital or reproductive gland, in the female into the ovary, in the male into the testis, the plica gubernatrix becomes in the former the *round ligament of the uterus,* in the latter the *gubernaculum testis.*

[96] *Genital Cord* (Fig. 899, p. 521).—Behind the stalk of the allantois (subsequently the base of the bladder) the Wolffian ducts are closely approximated to one another before opening into the urogenital sinus (the ventral segment of the cloaca). Between and somewhat behind them lie the uniting lower extremities of the Müllerian ducts. The ducts are all embedded in a mass of connective tissue, and to the whole structure thus formed is given the name of *genital cord.*

[97] (Fig. 919, p. 530.) The *rectococcygeus muscles* are bands of unstriated but reddish muscular tissue which passes backwards on each side of the rectum. Both Quain and Macalister describe these bands as attached behind to the front of the second and third pieces of the coccyx; but as Toldt points out, and Fig. 919 shows, the actual muscular tissue does not extend so far back as this, and the attachment to the coccyx is through the intermediation of the aponeurosis of the pubic part of the levator ani muscle.

[98] **Tendinous Arch of the Levator Ani Muscle* (Ibid.).—"The levator ani muscle arises for the most part from a tendinous arch in the obturator fascia, *arcus tendineus musculi levatoris ani,* which can be traced from the ischial spine to near the obturator canal" (Von Langer and Toldt's "Anatomy," 7th ed., p. 438).

[99] *Diaphragma Urogenitale* (Figs. 920 and 921, p. 531).—The author's application of the term *pelvic diaphragm* has been explained in note [87] above. In that structure there are two apertures—a circular one in the centre for the rectum, and a triangular one anteriorly for the urogenital canal (see Fig. 918, p. 530). The triangular space between the inferior or descending rami of the pubes is, however, too large to be completely filled in by the urogenital canal, and it is occupied by a musculofibrous plate bearing the same relation to that canal that the pelvic diaphragm bears to the rectum, and called by the author the *urogenital diaphragm.* The muscular portion of this diaphragm is by the author named *musculus transversus perinei profundus,* and in England *constrictor* or *compressor urethræ.* Its superficial and deep surfaces are covered by fascial layers which, like the muscle, are triangular in shape, with a truncated apex anteriorly and a free base posteriorly; these constitute the bilaminar *triangular ligament of the urethra* of English authors. The *superficial* layer of this ligament, called also *anterior* or *inferior* layer, is the author's *fascia diaphragmatis urogenitalis inferior;* it is continuous around the posterior margin of the (superficial) transverse perineal muscle with Colles's fascia, combining with that fascia to enclose a space in which lies the root of the penis and its accompanying muscles; it thus belongs to the extrapelvic system of fasciæ. The *deep* layer of the triangular ligament of the urethra, called also *posterior* or *superior* layer, is the author's *fascia diaphragmatis urogenitalis superior;* though connected around the posterior margin of the compressor urethræ with the superficial layer of the ligament, it belongs to the intrapelvic system of fasciæ; traced backwards it is seen to be a forward continuation of the *anal fascia;* laterally it joins the obturator fascia. The triangular ligament as a whole is sometimes called the *deep perineal fascia,* but this name should be avoided, having been applied also to Colles's fascia. The name of *subpubic fascia* may also give rise to confusion, being applied by Macalister to the deep layer only of the triangular ligament, but by Quain to that structure in its entirety. The *triangular ligament* exists also in the *female,* and between its layers lies the *constrictor urethræ* or *transversus perinei profundus* muscle, *but the *urogenital diaphragm* thus formed is almost completely divided by the vagina and the urethra into lateral halves (see Fig. 921, p. 531).

[100] *Transverse Ligament of the Pelvis* (Ibid.).—This occupies the subpubic angle adjacent to the truncated apex of the triangular ligament of the urethra, on a plane between that of the two layers of that ligament. Between the transverse ligament of the pelvis and the inferior pubic or subpubic ligament (*ligamentum arcuatum pubis,* according to Toldt) which occupies the apex of the subpubic angle are three foramina: a central foramen for the dorsal vein of the penis or clitoris, and lateral foramina for the dorsal artery and nerve of the penis or clitoris (see Figs. 920 and 921,

p. 531, and also **Part II., Fig. 456, p. 220, and Figs. 458 and 459, p. 221).**

[101] *Transversus Perinei Profundus* (Ibid.).—This name is here applied to the whole triangular mass of muscle between the layers of the triangular ligament, not merely, as is sometimes the case in English works on anatomy, to the posterior strand of transverse fibres only. Other names have been applied, especially by Guthrie and by Wilson, to different strands of fibres, which they described as distinct muscles, but later English authorities agree with Von Langer and Toldt in regarding this separation as purely artificial. In the female, owing to the greater width of the subpubic angle, the muscle is wider than in the male, and the name *transversus perinei profundus* is obviously preferable to that of constrictor urethræ. (See Fig. 921.)

[102] *Internal Pudic Artery and Vein* (Figs. 922 and 923 p. 532).—Macalister calls these vessels *pudic* without qualification. Usually, however, they are known as *internal pudic,* to distinguish them from the *external pudic* branches (*superior* and *inferior*) of the femoral vessels. Macalister calls these latter the *pubic* vessels. (See also note [110] below.)

[103] (Fig. 922, p. 532.) Though the author calls this the *divided edge of the obturator fascia,* it is, rather, the junction of the lower edge of this fascia with the lateral margins of the deep layer of the triangular ligament, the latter having been dissected off the upper surface of the transversus perinei profundus muscle. (See also notes [99] and [101] above.)

[104] *M. Sphincter Urethræ Membranaceæ* (Ibid.).—The muscle called by the author the *sphincter of the membranous urethra* consists merely of the circular fibres of the transversus perinei profundus muscle (see note [101] above) immediately surrounding the membranous part of the urethra.

[105] **Pudendal Venous Plexus* (Fig. 923, p. 532).—This term is not employed by English anatomists. Von Langer and Toldt ("Anatomy," 7th ed., p. 550) write: "The *pudendal plexus* receives beneath the symphysis the dorsal vein of the penis or clitoris, and, running back beside the base of the bladder and in the female beside the vagina, receives in both sexes the blood from the vesical plexus, and in the female also the blood from the uterine and vaginal plexuses. The pudendal plexus opens by several large vessels into the internal iliac vein." From this account it is evident that the pudendal plexus of these authors is made up of veins belonging in the male to the prostatic and vesical plexuses, and in the female to the vesical, vaginal, and uterine plexuses, of English anatomists.

[106] *Fascia Endopelvina* (Ibid.).—Von Langer and Toldt's "Anatomy," 7th ed., p. 444: "The *visceral layer of the pelvic fascia* is exposed by the removal of the peritoneum and the subserous areolar tissue from the parietes of the bladder and the rectum. It is given off along the *white line of the pelvic fascia* [see note [69] above] from the *parietal layer* of that fascia (*obturator fascia*), and, reaching the bladder, gives a complete fibrous investment to its anterior and lateral surfaces. Along the white line, the visceral layer is connected with the rectal fascia (*fascia diaphragmatis pelvis superior*), but as they pass inwards the two layers separate, the rectal fascia, following the levator ani, the upper surface of which it covers, dips deeply into the pelvis, whilst the visceral layer stretches transversely across to the bladder. Thus, between the rectal fascia and the visceral layer there exists on each side of the bladder a space, the *perivesical space,* in which, in addition to the ureter, the nerves of the bladder and the vesical plexus are enclosed. Behind the bladder, the visceral layer of the pelvic fascia assists in forming the pelviprostatic capsule or prostatic fascia [see note [74] above], and furnishes a delicate fibrous investment for the rectum."

I quote this passage in order to indicate clearly the significance attached in this work to the names given to the different parts of the pelvic fascia. Three layers pass inwards from the parietal layer of the pelvic fascia: the lowest of these, the *anal fascia,* covers the perineal surface of the levator ani; the next layer, the *rectal fascia,* covers the pelvic surface of that muscle: these correspond with the *superior* and *inferior fasciæ of the pelvic diaphragm* in the author's nomenclature. The uppermost layer is that described in the above extract as the *visceral layer of the pelvic fascia.* The relative positions of the three layers are well shown in Fig. 923. It will be noticed that I have avoided the use of the term *rectovesical fascia,* which is in England applied, sometimes to all three of the layers just enumerated, sometimes to one or two of them separately considered, and this gives rise to much confusion. The complexity that is apt to surround the description of the pelvic fascia is also, doubtless, in part dependent on the fact that, as Macalister says, "much of the definiteness of these layers in the adult is created by the knife and forceps" ("Anatomy," p. 446).

[107] *Hypogastric Artery* (Fig. 924, p. 533).—In the German anatomical nomenclature, the *common iliac* is said to divide into the *external iliac* and the *hypogastric arteries.* In England, however, the name *hypogastric artery* is given to that branch of the *internal iliac artery* which at the navel becomes the *umbilical artery.* When the placental circulation ceases, it is obliterated, and is represented in the adult by a fibrous cord.

[108] **Corpus Spongiosum Urethræ* (Fig. 927, p. 535).—This term, as applied to the female urethra, is not found in any works on anatomy to which I have access, not even in Von Langer and Toldt's "Anatomy." Quain (*op. cit.,* vol. iii., part iv., p. 258) writes: "Outside the submucous areolar tissue of the female urethra, there is a highly vascular structure, in which are many large veins"; and according to Macalister (*op. cit.,* p. 454): "Outside the mucosa [of the female urethra] is an elastic vascular submucosa covered by an imperfect erectile lamella. The use of the name *corpus spongiosum urethræ* for this erectile tissue is to be deprecated, suggesting as it does homology with the corpus spongiosum urethræ of the male. The counterparts of this structure in the female are the *vaginal bulbs* and the *partes intermediæ* of Kobelt. (See Figs. 884 and 885, p. 515, and note [91] above.)

[109] *Rectal Ampulla* (Fig. 932, p. 538).—This is the portion of the rectum, usually dilated, situate immediately above the *anal canal.* According to Macalister, the upper boundary of the *ampulla* is the lowest of *Houston's valves;* according to Quain, however, the middle one of these three folds (the *plica transversalis recti* of Kohlrausch—see note [11] above). The *rectal ampulla* is sometimes known as the *ampulla analis recti.*

[110] (Ibid.) The pudic vessels run in a canal formed by the obturator fascia, shown here (and also in Fig. 922, p. 532) in cross-section, and known as *Alcock's canal.* For the nomenclature of these vessels see note [102] above.

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TO THE SPLANCHNOLOGY

Certain names in this Index have an asterisk (*) prefixed; these, as more fully explained in the Translator's Preface, being terms that form part of the English nomenclature used in this work, but which are not commonly employed by English anatomists. To other names a dagger (†) is prefixed; these are Latin names used by the author in the original work, but not included in the official nomenclature of the "Anatomische Gesellschaft." Abbreviation: App. = Appendix.

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ERRATUM

In the letterpress of Fig. 797, p. 468, right-hand column, "Rudiment of the *uterus*" is a misprint for "Rudiment of the *ureter*."—Tr.

AN ATLAS

OF

HUMAN ANATOMY

FOR STUDENTS AND PHYSICIANS

BY

CARL TOLDT, M.D.

ASSISTED BY

PROFESSOR ALOIS DALLA ROSA, M.D.

Adapted to English and American and International Terminology

BY

M. EDEN PAUL, M.D. Brux., M.R.C.S., L.R.C.P.

FIFTH SECTION

F. ANGEIOLOGY

(FIGURES 933 TO 1123 AND INDEX)

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ANGIOLOGIA

ANGEIOLOGY

ANGEIOLOGY—GENERAL CONSIDERATIONS

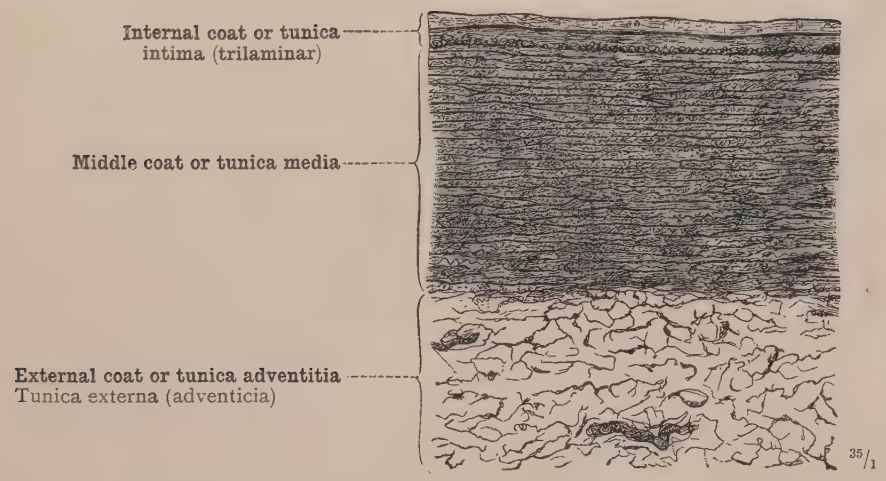

Internal coat or tunica intima (trilaminar)
Middle coat or tunica media
External coat or tunica adventitia
Tunica externa (adventicia)
35/1

FIG. 933.—PART OF A TRANSVERSE SECTION THROUGH THE WALL OF THE DESCENDING THORACIC AORTA (HUMAN); INTERNAL, MIDDLE AND EXTERNAL COATS; TUNICA INTIMA, MEDIA, ET EXTERNA.

In the external coat sections of two vasa vasorum are seen.

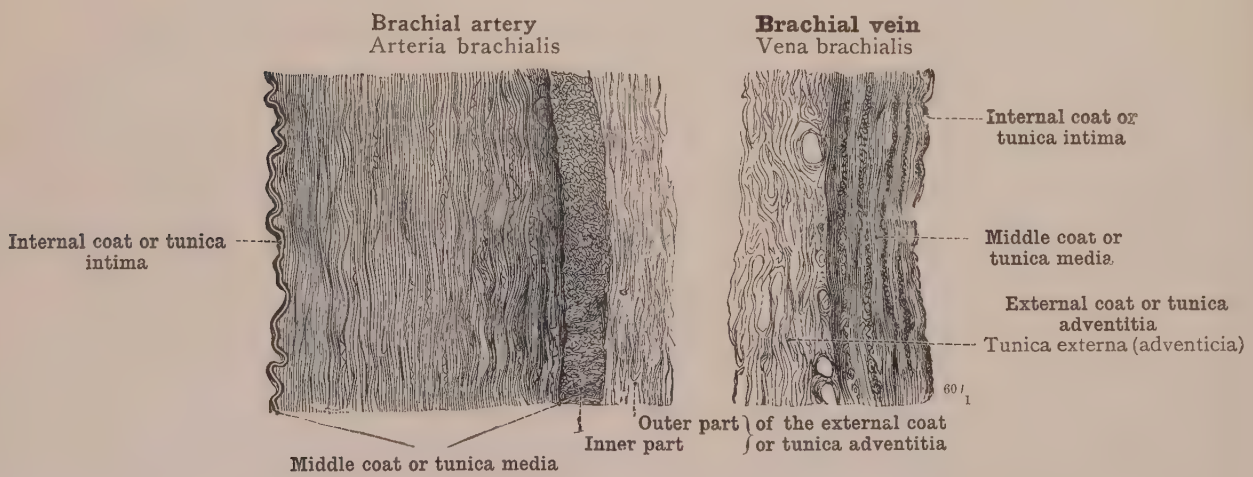


FIG. 934.—PART OF A TRANSVERSE SECTION THROUGH THE CUBITAL PORTION OF THE BRACHIAL ARTERY AND VEIN (HUMAN).

The Layers of the Walls of the Bloodvessels.

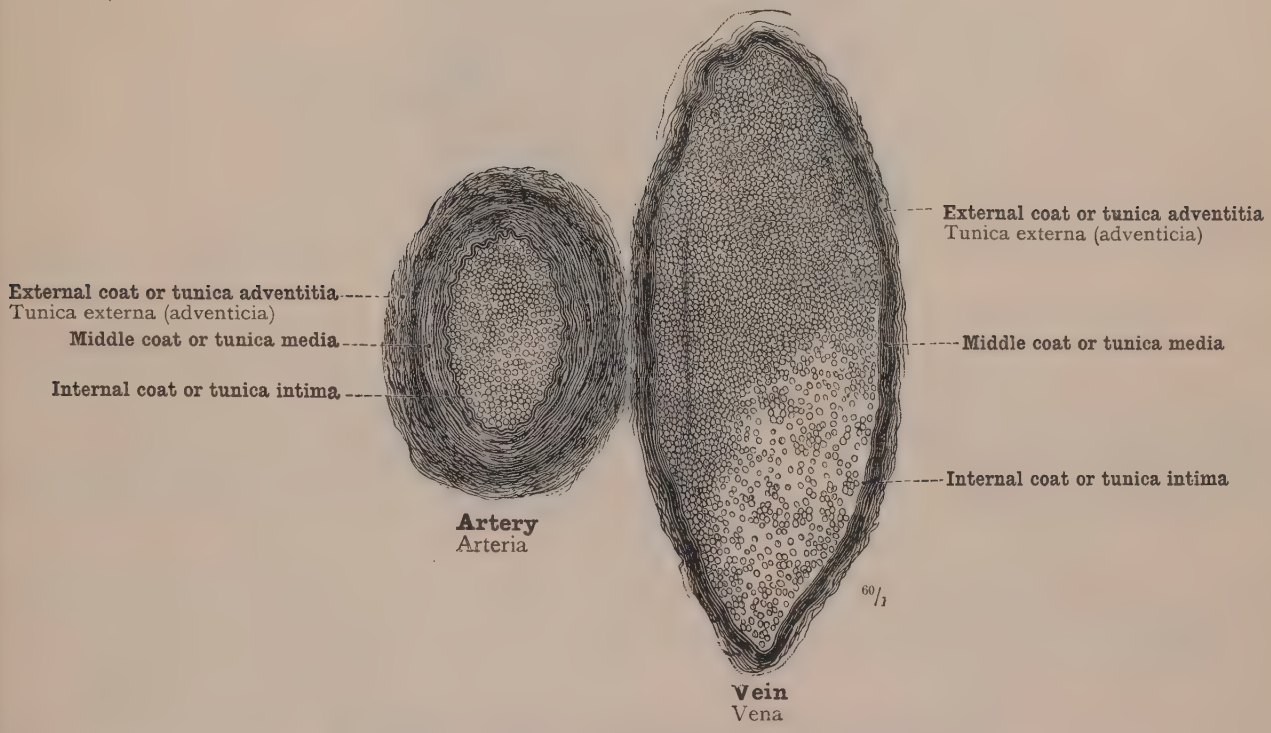


FIG. 935.—TRANSVERSE SECTION THROUGH AN ARTERY OF THE MESENTERY AND ITS ACCOMPANYING VEIN (HUMAN).

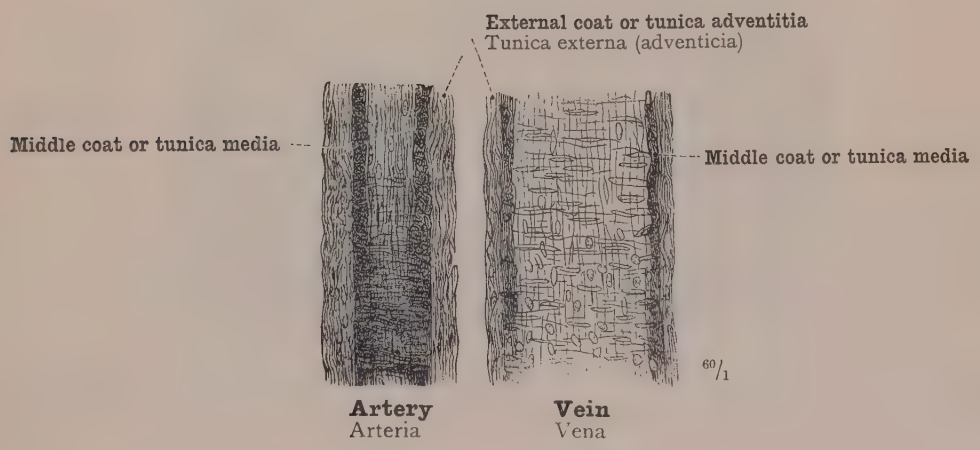


FIG. 936.—LONGITUDINAL SECTION OF A SMALL ARTERY AND VEIN OF THE PANCREAS.

The Layers of the Walls of the Bloodvessels.

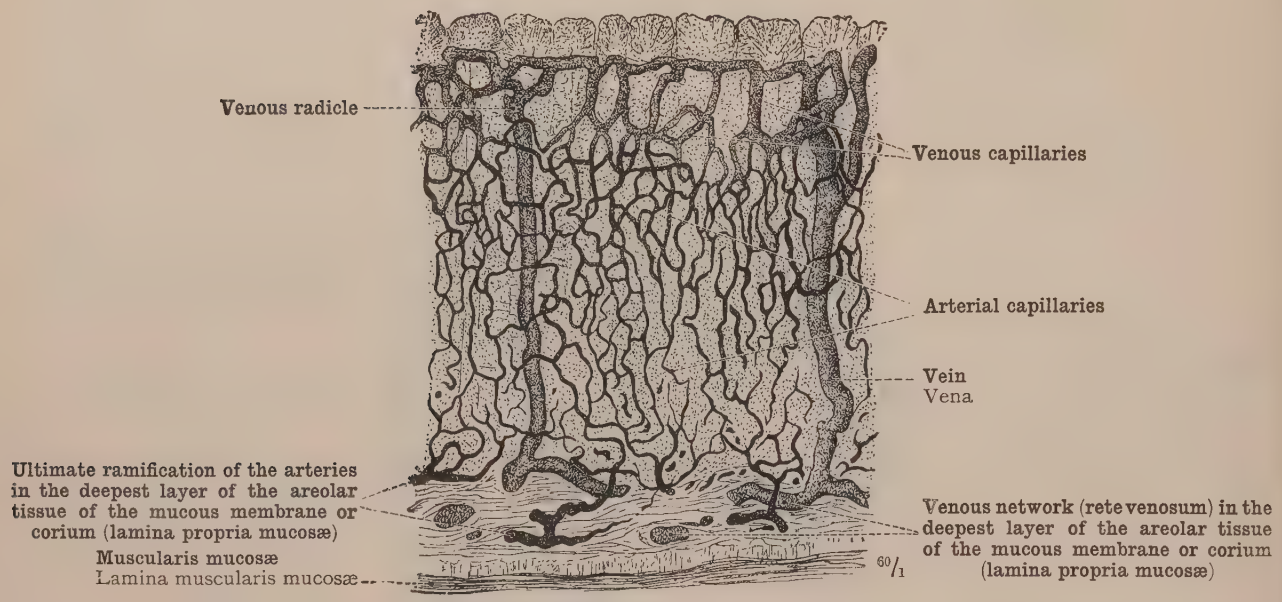

Venous radicle
Venous capillaries
Arterial capillaries
Vein
Vena
Ultimate ramification of the arteries in the deepest layer of the areolar tissue of the mucous membrane or corium (lamina propria mucosæ)
Muscularis mucosæ
Lamina muscularis mucosæ
Venous network (rete venosum) in the deepest layer of the areolar tissue of the mucous membrane or corium (lamina propria mucosæ)
60/1

FIG. 937.—BLOODVESSELS OF THE GASTRIC MUCOUS MEMBRANE IN VERTICAL SECTION: VASA CAPILLARIA, CAPILLARY VESSELS, AND THEIR CONNEXION WITH THE ARTERIES AND THE VEINS.

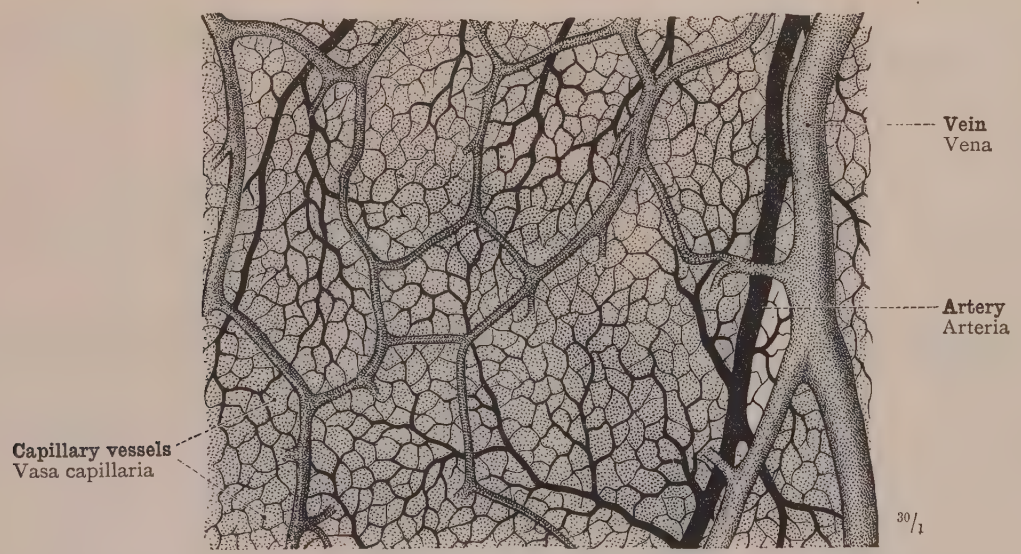


FIG. 938.—THE VENOUS NETWORK, RETE VENOSUM, AND THE ULTIMATE RAMIFICATION OF THE ARTERIES IN THE DEEPEST LAYER OF THE CORIUM (LAMINA PROPRIA MUCOSÆ) OF THE GASTRIC MUCOUS MEMBRANE.

The plane of the vascular network is parallel with the surface of the mucous membrane.

The Capillary and Subcapillary Vascular Ramification.

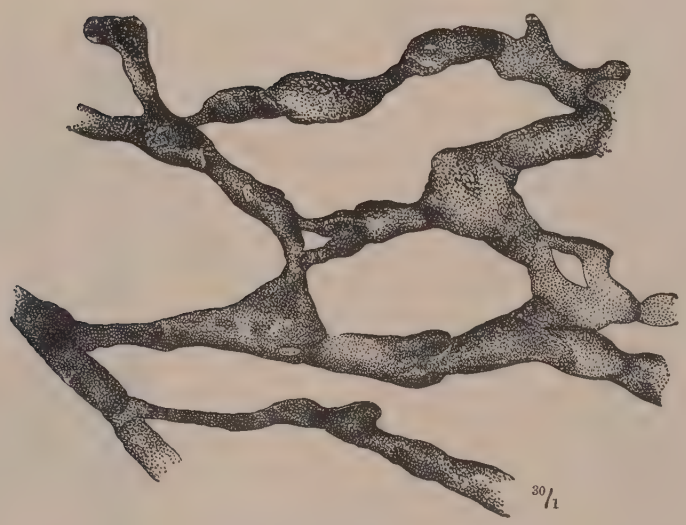


FIG. 939.—VALVED SUBCAPILLARY LYMPHATIC VESSELS (VASA LYMPHATICA) FROM THE SUBMUCOUS LYMPHATIC PLEXUS OF THE HUMAN OCULAR CONJUNCTIVA (CONJUNCTIVA BULBI), INJECTED WITH TRANSPARENT GELATIN.

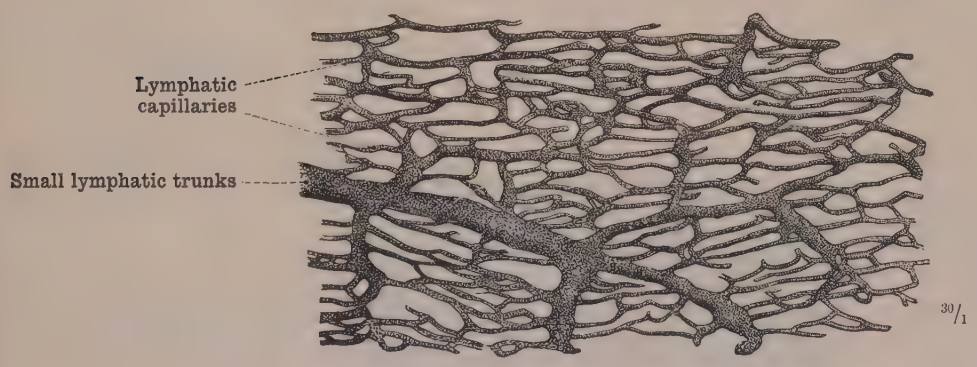


FIG. 940.—LYMPHATIC CAPILLARIES FROM THE MUSCULAR COAT OF THE STOMACH OF THE FROG, INJECTED WITH OPAQUE YELLOW GELATIN.

The Capillary and Subcapillary Lymphatics (Vasa Lymphatica).

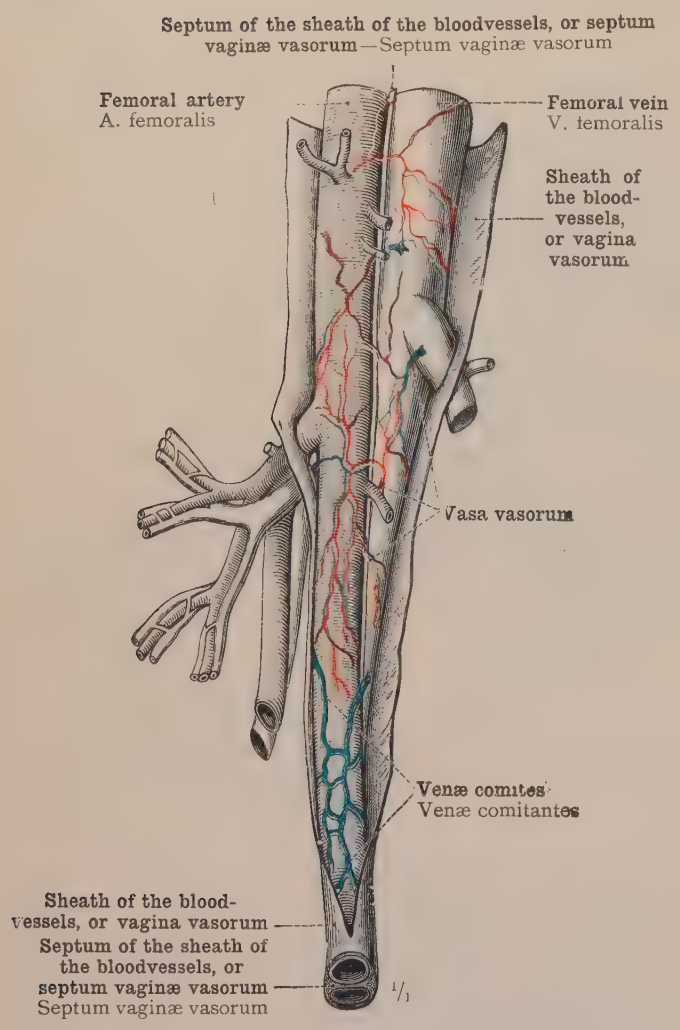

Septum of the sheath of the bloodvessels, or septum vaginæ vasorum—Septum vaginæ vasorum
Femoral artery
A. femoralis
Femoral vein
V. femoralis
Sheath of the blood-vessels, or vagina vasorum
Vasa vasorum
Venæ comites
Venæ comitantes
Sheath of the blood-vessels, or vagina vasorum
Septum of the sheath of the bloodvessels, or septum vaginæ vasorum
Septum vaginæ vasorum
1/1

FIG. 941.—THE SHEATH OF THE FEMORAL ARTERY AND VEIN, OPENED. THE VASA VASORUM AND THE VENÆ COMITES[1] OF THE FEMORAL ARTERY. SEMIDIAGRAMMATIC.

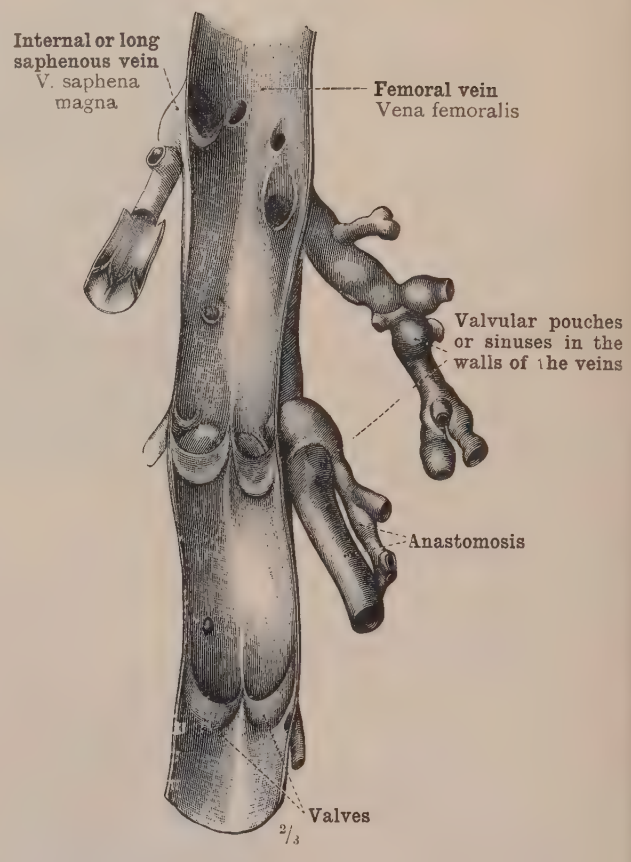


FIG. 942.—THE VALVES OF THE EXCISED FEMORAL VEIN AND ITS BRANCHES.

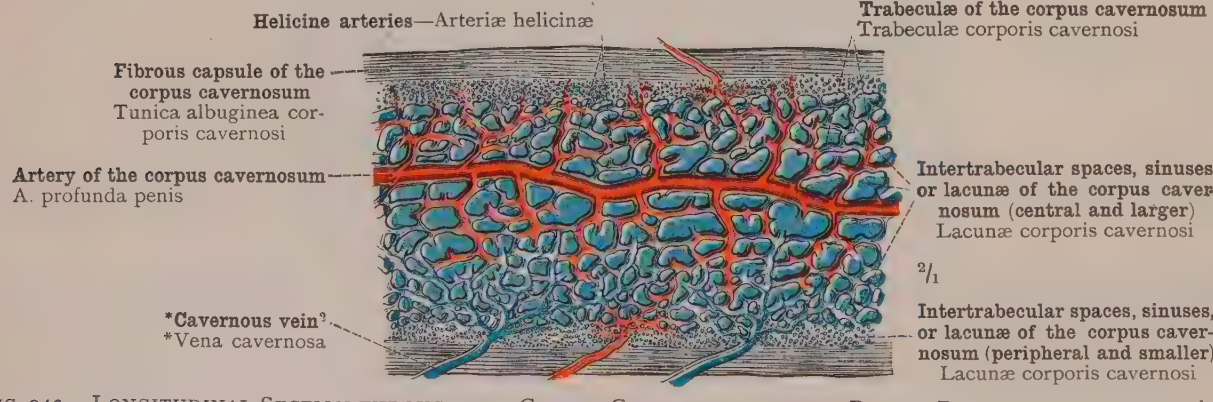

Helicine arteries—Arteriæ helicinæ
Trabeculæ of the corpus cavernosum
Trabeculæ corporis cavernosi
Fibrous capsule of the corpus cavernosum
Tunica albuginea corporis cavernosi
Artery of the corpus cavernosum
A. profunda penis
Intertrabecular spaces, sinuses, or lacunæ of the corpus cavernosum (central and larger)
Lacunæ corporis cavernosi
2/1
*Cavernous vein[2]
*Vena cavernosa
Intertrabecular spaces, sinuses, or lacunæ of the corpus cavernosum (peripheral and smaller)
Lacunæ corporis cavernosi

FIG. 943.—LONGITUDINAL SECTION THROUGH THE CORPUS CAVERNOSUM OF THE PENIS: RAMIFICATION OF THE ARTERY OF THE CORPUS CAVERNOSUM (ARTERIA PROFUNDA PENIS); ARTERIÆ HELICINÆ, HELICINE ARTERIES; VENÆ CAVERNOSÆ, *CAVERNOUS VEINS[2]; THE FIBROUS CAPSULE, THE TRABECULÆ, AND THE INTERTRABECULAR SPACES, SINUSES, OR LACUNÆ OF THE CORPUS CAVERNOSUM. SEMIDIAGRAMMATIC.

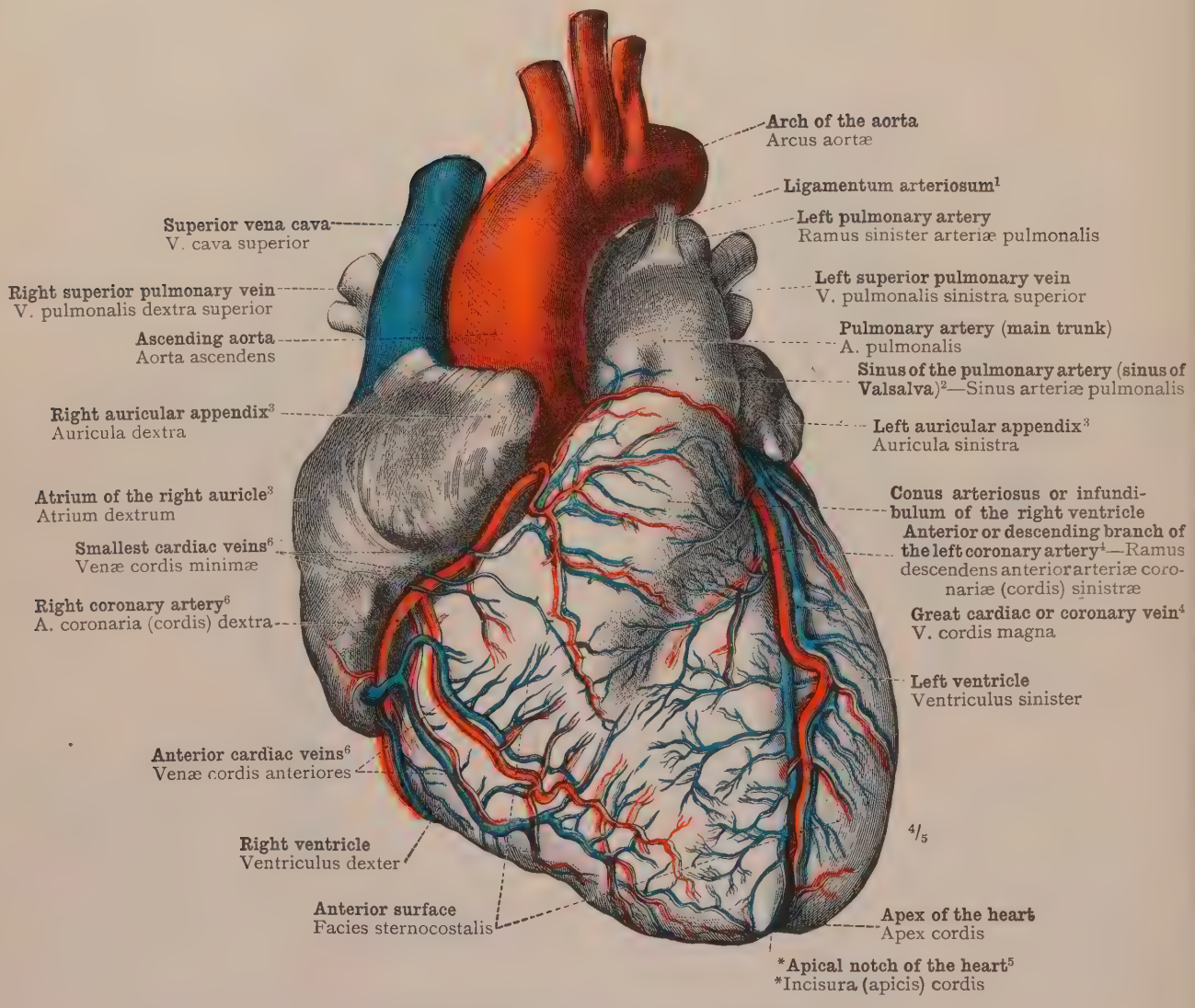
[1] In full, *venæ comites vel satellites arteriarum.*

[2] *Venæ Cavernosæ.*—The venous blood leaves the corpora cavernosa of the penis by two roots. A larger moiety leaves the crura to join the internal pudic veins by the *veins of the corpora cavernosa* (corresponding to the arteries of the same name). The remainder passes by small veins which pierce the fibrous capsule of the corpora cavernosa in the free region of the penis, and, anastomosing with cutaneous veins, join the dorsal vein of the penis. These latter are called by Toldt **cavernous veins.*—TR.

Vasa vasorum.—Vagina vasorum, the sheath of the bloodvessels.—The valves of the veins.—Corpus cavernosum of the penis.

COR

THE HEART

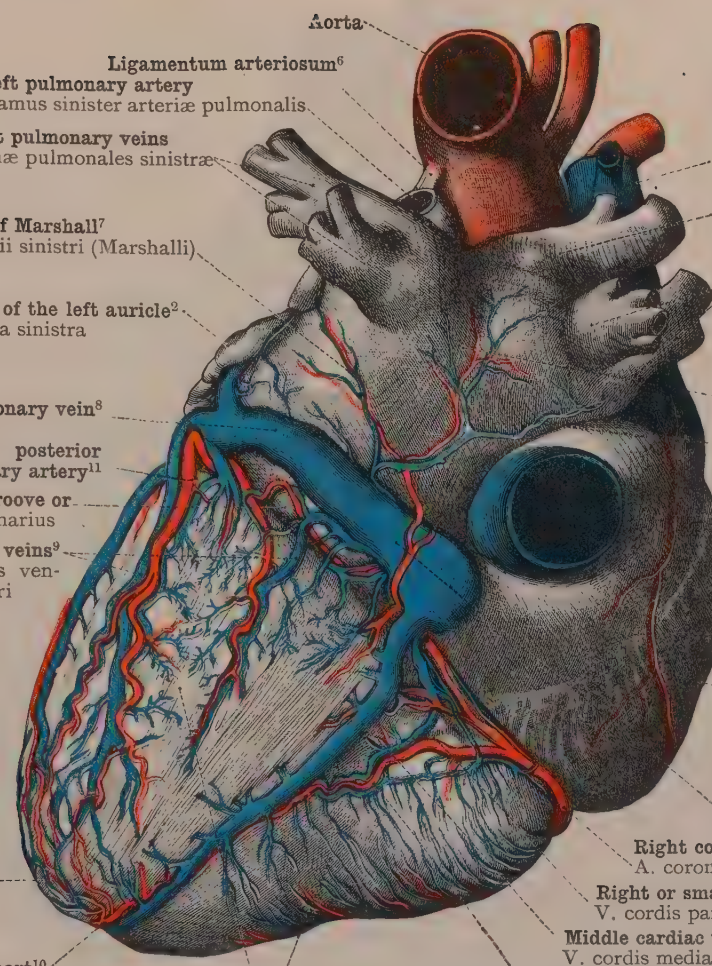


1 See Appendix, note 111. 2 See Appendix, note 112. 3 See Appendix, note 113.
4 These vessels are named by Macalister the *anterior interventricular artery* and *vein*.—Tr.
5 **Apical Notch of the Heart.*—This is merely the apical portion of the *interventricular groove*, *furrow*, or *sulcus*.—Tr.
6 See Appendix, note 114.
7 *Borders of the Heart.*—These are not mentioned by the author in the original work. The *upper* or *left border*, conspicuous in the present figure, is shorter, rounder, and thicker than the other, hence it is often called *margo obtusus*; the *lower* or *right border*, conspicuous in Fig. 945, is longer, and is thin compared with the other: for this reason it is distinguished as *margo acutus*.—Tr.

FIG. 944.—THE HEART SEEN FROM BEFORE, WITH INJECTED CORONARY VESSELS: THE RIGHT CORONARY ARTERY, ARTERIA CORONARIA (CORDIS) DEXTRA; THE ANTERIOR OR DESCENDING BRANCH OF THE LEFT CORONARY ARTERY; THE COMMENCEMENT OF THE GREAT CARDIAC OR CORONARY VEIN, VENA CORDIS MAGNA; THE ANTERIOR CARDIAC AND THE SMALLEST CARDIAC VEINS, VENÆ CORDIS ANTERIORES ET VENÆ CORDIS MINIMÆ. THE LIGAMENTUM ARTERIOSUM, OR LIGAMENT OF BOTALLUS (*see Appendix, note* 111). MARGO OBTUSUS CORDIS, THE UPPER OR LEFT BORDER OF THE HEART (*see note* 7 *above*).

The cavities of the heart have been injected with tallow.

External Appearance and Bloodvessels of the Heart.



Aorta
Ligamentum arteriosum[6]
Left pulmonary artery
Ramus sinister arteriæ pulmonalis
Left pulmonary veins
Venæ pulmonales sinistræ
Oblique vein of Marshall[7]
V. obliqua atrii sinistri (Marshalli)
Atrium of the left auricle[2]
Auricula sinistra
Great cardiac or coronary vein[8]
V. cordis magna
Marginal branch of the posterior division of the left coronary artery[11]
Auriculoventricular groove or furrow—Sulcus coronarius
Posterior cardiac veins[9]
Venæ posteriores ventriculi sinistri
Apex of the heart
Apex cordis
***Apical notch of the heart**[10]
*Incisura (apicis) cordis
Posterior surface—Facies diaphragmatica

Superior vena cava and the proximal extremity of the azygos vein[1]
Vena cava superior et extremitas superior venæ azygos
Right pulmonary artery
Ramus dexter arteriæ pulmonalis
Right pulmonary veins
Venæ pulmonales dextræ
Atrium of the left auricle[2]
Atrium sinistrum
Posterior interauricular groove or furrow[13]
Sulcus longitudinalis posterior (interauricularis)
Inferior vena cava
V. cava inferior
Sinus venosus of the right auricle[3]
Sinus venarum (cavarum)
Sulcus terminalis of the right auricle[3]
Sulcus terminalis atrii dextri
Atrium of the right auricle[2]
Atrium dextrum
4/5
Coronary sinus
Sinus coronarius
Right coronary artery[4]
A. coronaria (cordis) dextra
Right or small cardiac vein
V. cordis parva
Middle cardiac vein[5]
V. cordis media
Descending branch of the right coronary artery, or posterior interventricular artery[4]—Ramus descendens posterior arteriæ coronariæ (cordis) dextræ

1 Sometimes called the *right* or *large azygos vein.*
2 See Appendix, note 113.
3 See Appendix, note 115.
4 See Appendix, note 116.
5 Named by Macalister the *posterior interventricular vein.*
6 See Appendix, note 111.
7 See Appendix, note 117.
8 Ending in the *coronary sinus.*
9 Called by Macalister the *left marginal veins.*
10 See note 5 to p. 562.
11 Named by Macalister the *left marginal artery.*
12 See Appendix, note 118.
13 See note 5 to p. 566.

FIG. 945.—THE HEART SEEN FROM BEHIND, WITH INJECTED CORONARY VESSELS: THE RIGHT CORONARY ARTERY, ARTERIA CORONARIA (CORDIS) DEXTRA, WITH ITS DESCENDING BRANCH, RAMUS DESCENDENS POSTERIOR (POSTERIOR INTERVENTRICULAR ARTERY); THE POSTERIOR OR TRANSVERSE BRANCH OF THE LEFT CORONARY ARTERY, RAMUS CIRCUMFLEXUS ARTERIÆ CORONARIÆ (CORDIS) SINISTRÆ, GIVING OFF THE LARGE MARGINAL BRANCH; THE GREAT CARDIAC OR CORONARY VEIN, VENA CORDIS MAGNA, TERMINATING IN THE CORONARY SINUS, SINUS CORONARIUS; THE MIDDLE AND THE RIGHT OR SMALL CARDIAC VEINS, VENÆ CORDIS MEDIA ET PARVA; THE OBLIQUE VEIN OF MARSHALL, VENA OBLIQUA ATRII SINISTRI (MARSHALLI). THE SULCUS TERMINALIS OF THE RIGHT AURICLE, SULCUS TERMINALIS ATRII DEXTRI; AND THE SINUS VENOSUS, SINUS VENARUM (CAVARUM). *CORONA CORDIS (*see Appendix, note* [118]), BASIS CORDIS (*see Appendix, note* [118]), AND THE INFERIOR SURFACE (FACIES DIAPHRAGMATICA) OF THE HEART. MARGO ACUTUS CORDIS, THE LOWER OR RIGHT BORDER OF THE HEART (*see note* [7] *on p.* 562).

The same preparation as that seen in Fig. 944, viewed in this case from behind.

External Appearance and Bloodvessels of the Heart.

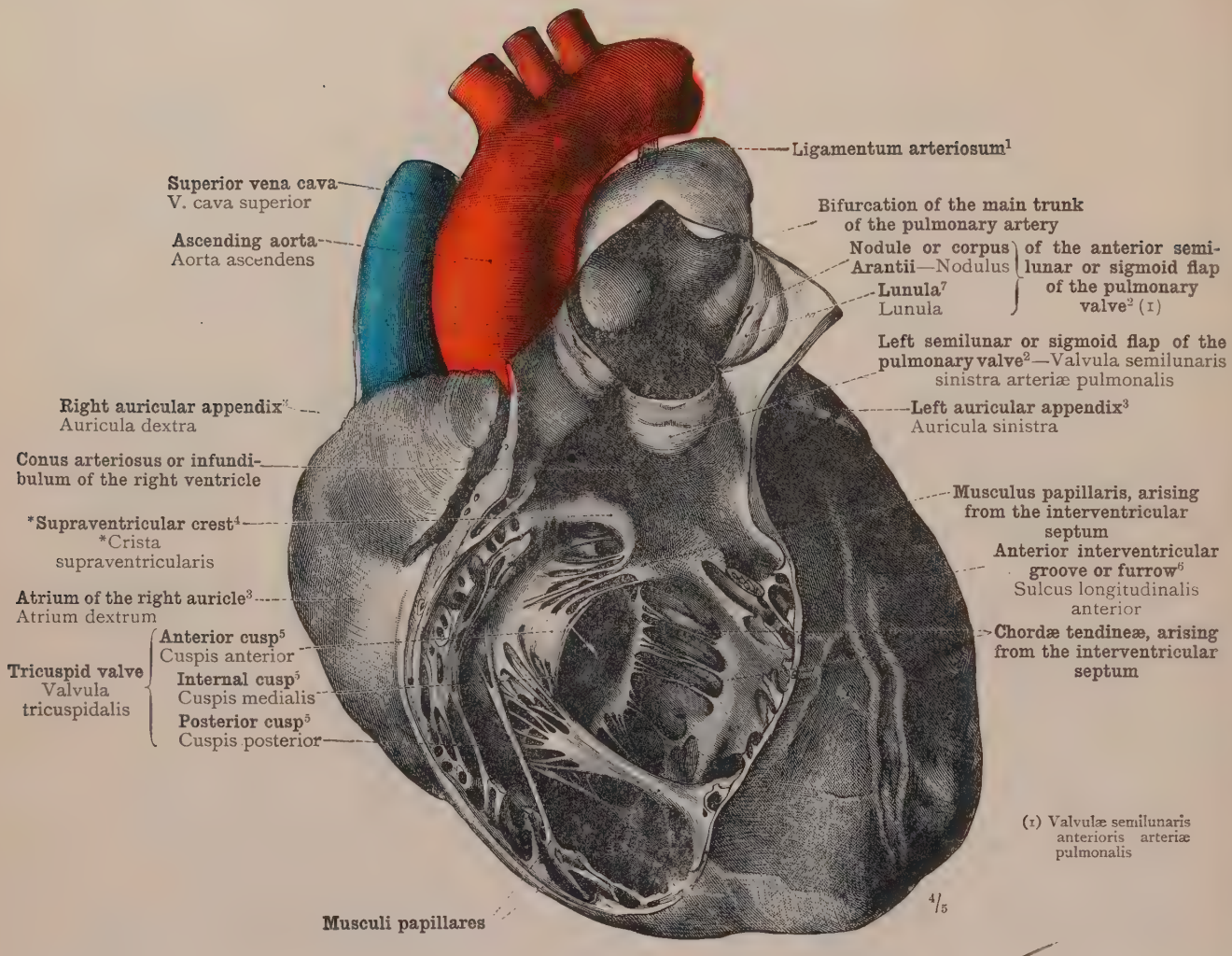


FIG. 946.—THE HEART SEEN FROM BEFORE.

The anterior wall of the right ventricle and of the conus arteriosus or infundibulum has been removed; the main trunk of the pulmonary artery, arteria pulmonalis, has been opened by an incision passing from a point between the anterior and the right semilunar or sigmoid flaps of the pulmonary valve[2] to the bifurcation, and the anterior wall of the artery has been turned to the left. In this manner the tricuspid valve, valvula tricuspidalis, with its papillary muscles, musculi papillares, and tendinous chords, chordæ tendineæ, and also the semilunar or sigmoid flaps of the pulmonary valve with their nodules, or corpora Arantii, and lunulæ, have been brought into view. The heart had previously been hardened in the distended state (*i.e.*, in diastole) by immersion in chromic acid solution and alcohol.

[1] See Appendix, note [111].

[2] *Flaps of the Aortic and Pulmonary Valves.*—These are differently designated by different authorities. I. The *Pulmonary Valve.* According to Von Langer and Toldt, the flaps of this valve are *anterior*, *right*, and *left*; according to Quain, they are *right*, *left*, and *posterior*; and according to Macalister, they are (1) *anterior* and to the left, (2) posterior and to the *right*, and (3) posterior and to the *left*. II. The *Aortic Valve.* According to Von Langer and Toldt, the flaps of this valve are *posterior*, *right*, and *left*; according to Quain, they are *anterior*, *right*, and *left*; and according to Macalister, they are (1) behind and to the right, (2) forward and to the right, and (3) forward and to the left. The position of these flaps can be accurately determined only by the examination of frozen sections of the thorax. The eleventh plate of Braune's "Atlas of Topographical Anatomy" (English edition) gives an excellent view of the aortic and pulmonary valves, and if the arrangement there figured is a normal one, Quain's description is certainly to be preferred. In the text, however, I follow Toldt's nomenclature of the flaps.—TR.

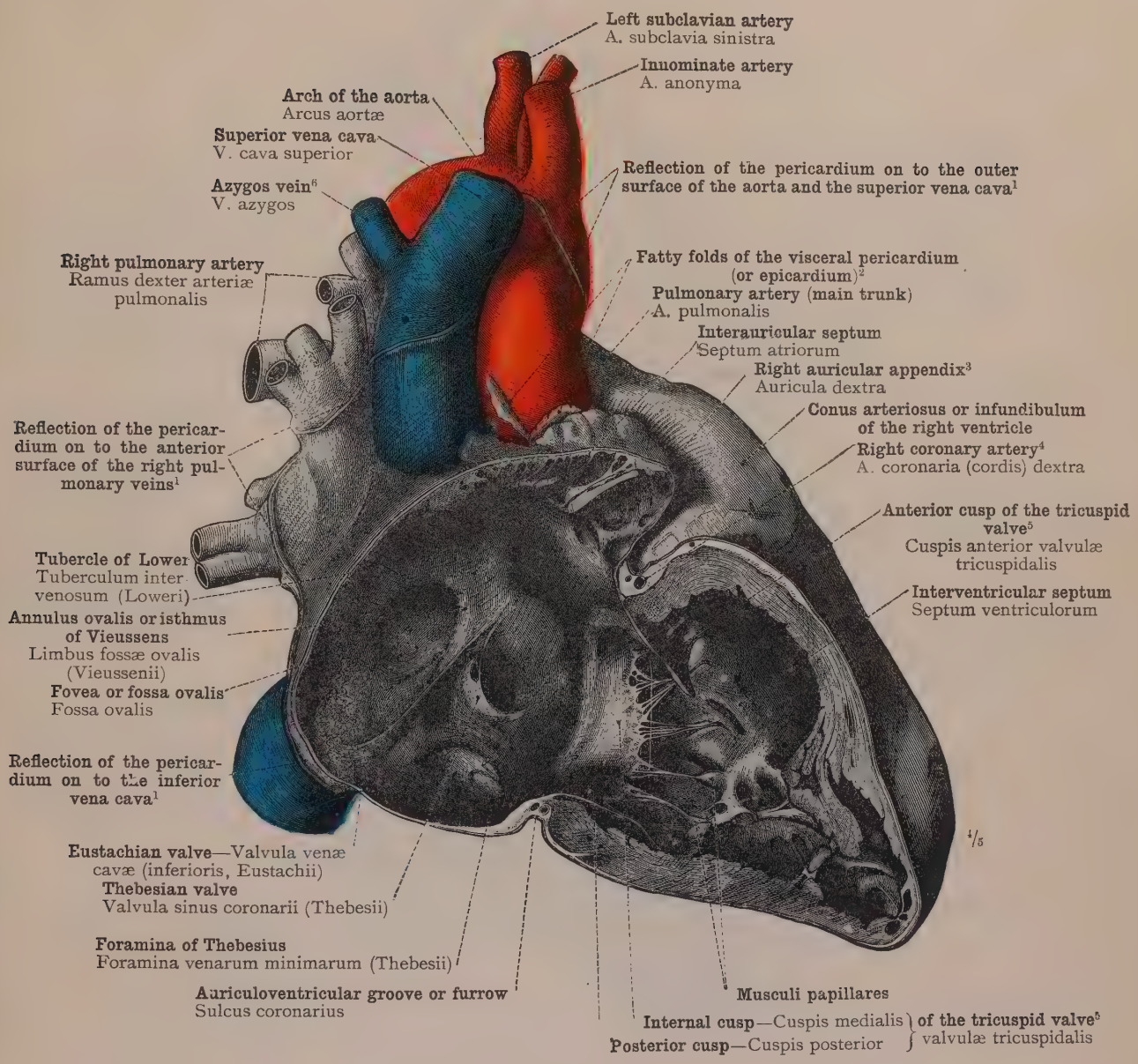
[3] See Appendix, note [113].

[4] **Supraventricular Crest.*—"On the inner wall of the right ventricle, between the *ostium venosum* (tricuspid orifice) and the conus arteriosus (or infundibulum), there is an eminence that projects freely into the ventricular cavity: this is the *crista supraventricularis*. Thus, whereas on the left side of the heart the mitral and aortic orifices are closely approximated one to the other, and are surrounded by a common ring of muscular tissue, on the right side of the heart the tricuspid and pulmonary orifices are a little distance apart, and each is surrounded by its own ring of muscular tissue." (Von Langer and Toldt, *op. cit.*, p. 481). Quain (*op. cit.*, vol. ii., part ii., pp. 358, 359), speaking of the tricuspid and pulmonary orifices, writes: "Between the two the wall of the cavity projects downwards in the form of a thick, rounded muscular partition, which corresponds to the beginning of the aorta from the left ventricle"; but he gives the structure in question no name. Macalister (*op. cit.*, p. 327) writes: "Between the auriculoventricular and the pulmonic openings is an area in the septal wall crossed by oblique pilasters, called the *fleshy pons*."—TR.

[5] *Tricuspid Valve.*—The *cusps* or *flaps* of this valve are variously named by different authorities. *Cuspis anterior*, the *anterior cusp* of Toldt, is similarly named by Macalister, but by Quain is called the *infundibular* or *left flap*; *cuspis medialis*, the *internal cusp* of Toldt, is called the *right flap* both by Quain and by Macalister; *cuspis posterior*, the *posterior cusp* of Toldt, is called *posterior* also by Macalister, and by Quain the *posterior* or *septal flap*.—TR.

[6] See note 5 to p. 566.

[7] *Lunula.*—This term denotes the thin, narrow portion at the free edge of the semilunar flaps of the aortic and pulmonary valves. Toldt, however, describes *one* lunula in each flap, in the middle of which is the nodule or corpus Arantii; whereas English anatomists recognise *two* lunulæ in each flap, separated from one another by the nodule.—TR.


Left subclavian artery
A. subclavia sinistra
Innominate artery
A. anonyma
Arch of the aorta
Arcus aortæ
Superior vena cava
V. cava superior
Azygos vein[6]
V. azygos
Reflection of the pericardium on to the outer surface of the aorta and the superior vena cava[1]
Right pulmonary artery
Ramus dexter arteriæ pulmonalis
Fatty folds of the visceral pericardium (or epicardium)[2]
Pulmonary artery (main trunk)
A. pulmonalis
Interauricular septum
Septum atriorum
Right auricular appendix[3]
Auricula dextra
Conus arteriosus or infundibulum of the right ventricle
Right coronary artery[4]
A. coronaria (cordis) dextra
Reflection of the pericardium on to the anterior surface of the right pulmonary veins[1]
Anterior cusp of the tricuspid valve[5]
Cuspis anterior valvulæ tricuspidalis
Tubercle of Lower
Tuberculum intervenosum (Loweri)
Interventricular septum
Septum ventriculorum
Annulus ovalis or isthmus of Vieussens
Limbus fossæ ovalis (Vieussenii)
Fovea or fossa ovalis
Fossa ovalis
Reflection of the pericardium on to the inferior vena cava[1]
1/5
Eustachian valve—Valvula venæ cavæ (inferioris, Eustachii)
Thebesian valve
Valvula sinus coronarii (Thebesii)
Foramina of Thebesius
Foramina venarum minimarum (Thebesii)
Auriculoventricular groove or furrow
Sulcus coronarius
Musculi papillares
Internal cusp—Cuspis medialis } of the tricuspid valve[5]
Posterior cusp—Cuspis posterior } valvulæ tricuspidalis

[1] Or junction of the *parietal* and *visceral pericardium* (see also note [2]).
[2] *Epicardium.*—The pericardium, like other serous membranes, consists of *outer* and *inner*, or *parietal* and *visceral* layers. The visceral or *cardiac* pericardium is called by Toldt the *epicardium*, and the latter name is occasionally used also in England.—TR.
[3] See Appendix, note [113]. [4] See Appendix, note [114]. [5] See note 5 to p. 564.
[6] Sometimes called the *right* or *large azygos vein*.

FIG. 947.—THE HEART SEEN FROM THE RIGHT SIDE.

The heart having been hardened in formalin in the distended state (*i.e.*, in diastole), the right portion of the ventricles and the auricles was removed by a section passing upwards from the apex of the heart to the outer side of the orifices of the superior and inferior venæ cavæ. In the right ventricle, ventriculus dexter, the following structures are seen: The anterior, posterior, and internal cusps of the tricuspid valve (*see note [5] to p.* 564), also the musculi papillares and the chordæ tendineæ that arise from the interventricular septum. In the right auricle we see the fovea or fossa ovalis, with the annulus ovalis or isthmus of Vieussens, and the tubercle of Lower; also the orifices of the venæ cavæ, the Eustachian valve, the orifice of the coronary sinus with the Thebesian valve, and the cavity of the right auricular appendix (auricula dextra). On the aorta, the superior vena cava, and the right pulmonary veins, we see the reflection of the parietal pericardium to form the visceral pericardium (*see note [2] above*).

The right auricle—Atrium dextrum.—The right ventricle—Ventriculus dexter.

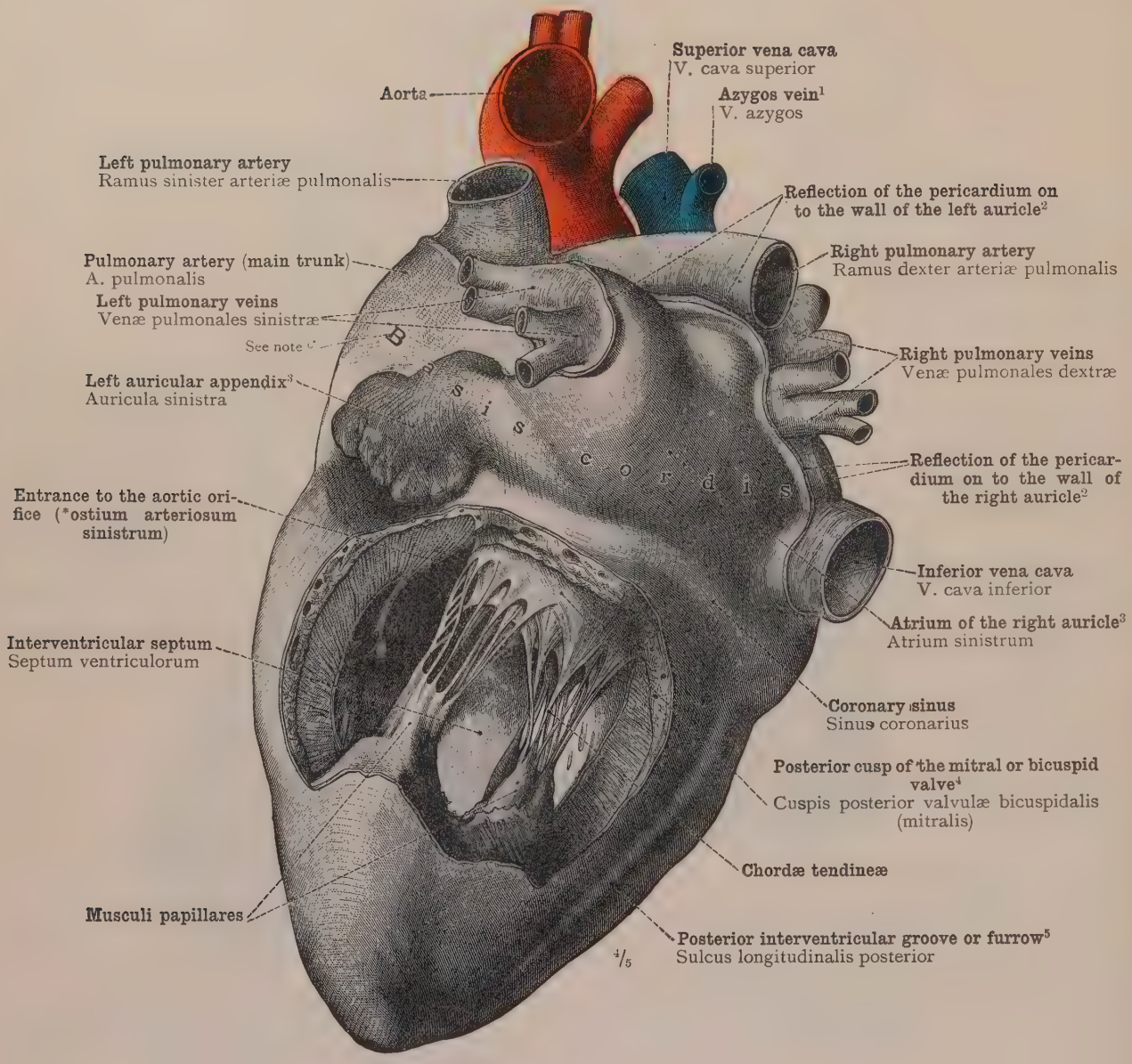


FIG. 948.—THE HEART SEEN FROM THE LEFT SIDE AND BELOW.

In the left ventricle, ventriculus sinister, which has been opened by the removal of a portion of its posterior wall, the mitral or bicuspid valve, valvula bicuspidalis (mitralis), the two musculi papillares, and the chordæ tendineæ of the latter, are displayed. At the base of the heart the reflection of the parietal pericardium to form the visceral pericardium of the auricles is seen (*see notes [1] and [2] to p.* 565). The preparation is the same as that shown in Fig. 946.

[1] Sometimes called the *right* or *large azygos vein.*

[2] Or junction of the *parietal* with the *visceral pericardium* (epicardium); see also note [2] to page 565.

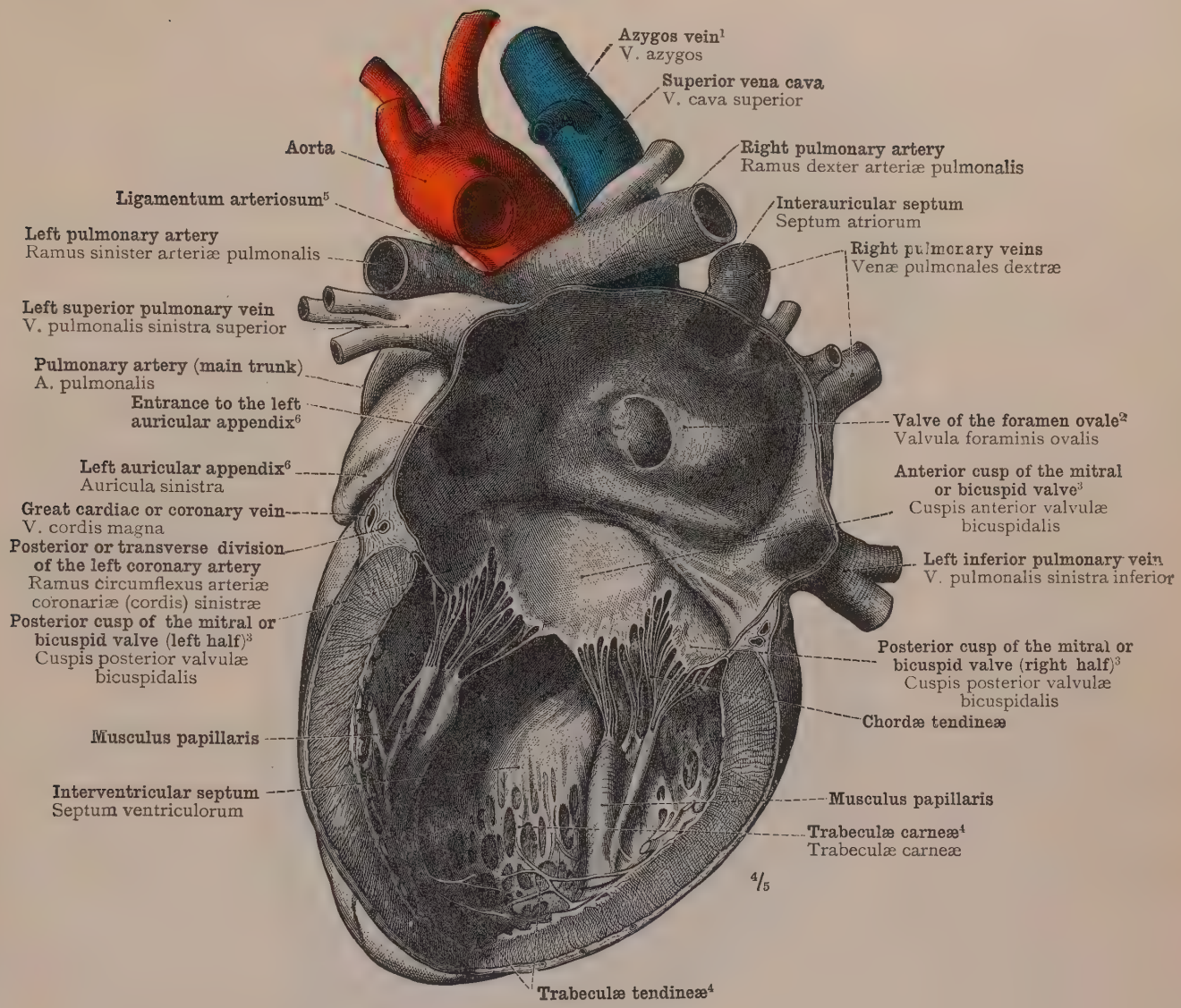
[3] See Appendix, note [113].

[4] *Mitral or Bicuspid Valve.*—The *cusps* or *flaps* of this valve are named *anterior* and *posterior* respectively, but do not lie exactly in front and behind one another in coronal planes. The *anterior* flap, which is the larger of the two, is to the right as well as in front, between the mitral and the aortic orifices (hence it is some imes named the *aortic* flap of the mitral valve); the *posterior* and smaller flap lies to the left of as well as behind the other, and close to the wall of the ventricle At each side of the orifice, in the angles of junction of the large flaps, are small intermediate flaps.—TR.

[5] *Sulcus Longitudinalis.*—Strictly, this term, as used by the author, denotes, not only the interventricular groove or furrow (anterior or posterior, as the case may be), but in addition the much less strongly marked interauricular groove or furrow. In the text, however, I have translated the term *sulcus longitudinalis*, either as *interventricular* or as *interauricular groove* or *furrow*, according as the ventricular or the auricular part of the *longitudinal sulcus is indicated in the several figures.—TR.

[6] *Basis Cordis, or Corona Cordis.*—These terms are used by the author as alternative names for that portion of the heart (together with the intrapericardial extremities of the great vessels) that lies above and to the right of the auriculoventricular groove. In England, however, the term *base of the heart* has a different signification. (See also Appendix, note [118].)—TR.

Left ventricle—Ventriculus sinister.

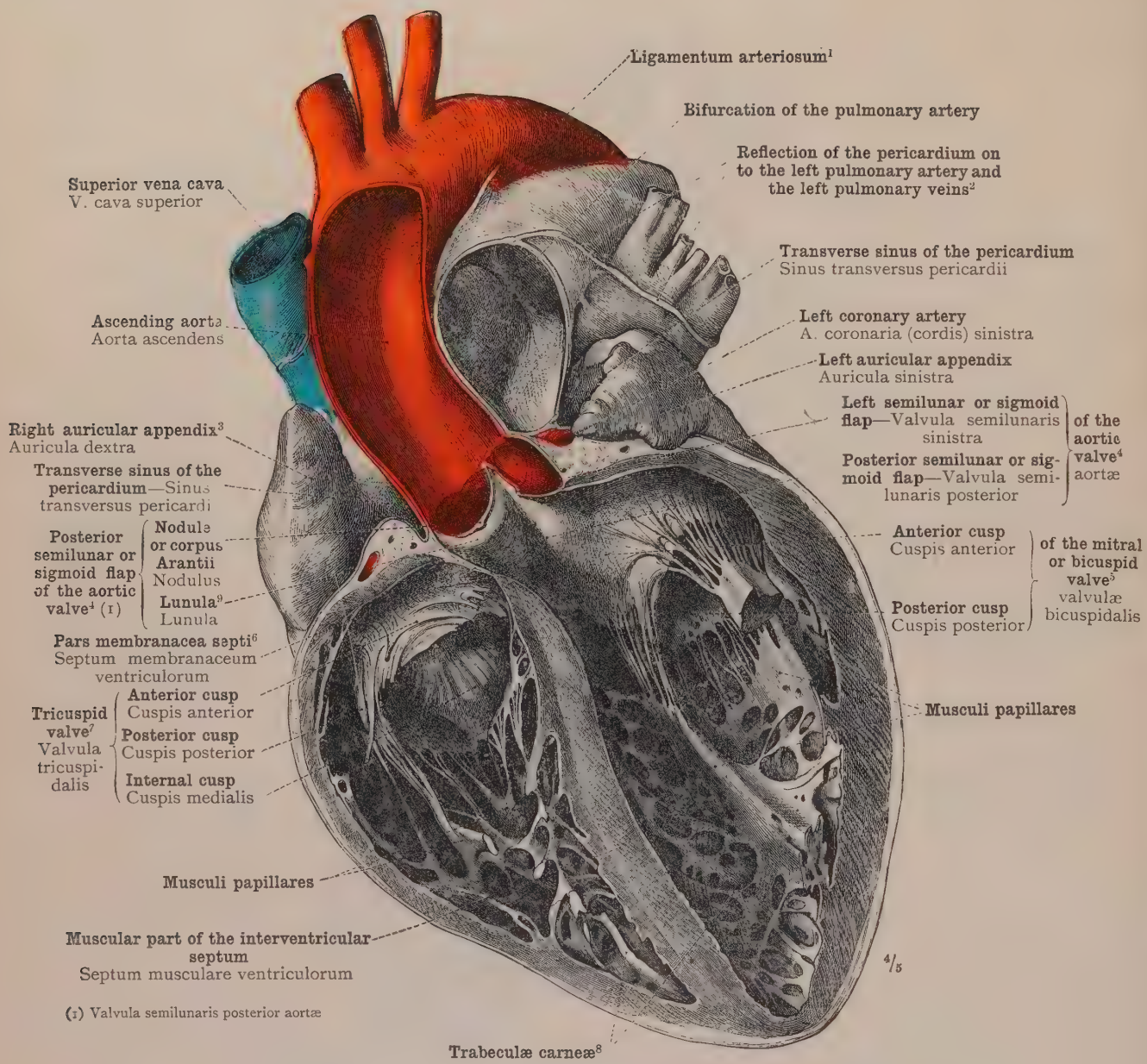


1 Called also the *right* or *large azygos vein.*
2 Called by Macalister *valvula sinistra sacci venosi.*
3 See note 4 to p. 566.
4 *Columnæ Carneæ.*—These muscular bands, projecting inwards from the walls into the cavities of the ventricles, are of two kinds: some are simply ridges, termed *pilasters;* others form bridges or beams, attached at their extremities but free in the middle, known as *trabeculæ.* Some of the trabeculæ, near the apex of the heart, are tendinous throughout the extent of their free parts, and these are distinguished as *trabeculæ tendineæ* from the more numerous, *trabeculæ carneæ*, which are fleshy throughout.—TR.
5 See Appendix, note 111.
6 See Appendix, note 113.

FIG. 949.—THE HEART SEEN FROM THE LEFT SIDE.

The left ventricle and the left auricle have been opened by an incision passing upwards from the apex of the heart to the space between the auricular orifices of the left pulmonary veins, and through the upper wall of the left auricle to the space between the auricular orifices of the right pulmonary veins, and the lateral walls of the cavities have been drawn outwards. In the left ventricle, ventriculus sinister, we see the divided posterior flap, cuspis posterior, and the intact anterior or aortic flap, cuspis anterior, of the mitral or bicuspid valve; also the anterior and posterior papillary muscles, musculi papillares, with their chordæ tendineæ; also the interventricular septum, septum ventriculorum, the trabeculæ carneæ, and, near the apex, a few free tendinous trabeculæ, trabeculæ tendineæ. In the left auricle we see the orifices of the four pulmonary veins, venæ pulmonales; the interauricular septum, septum atriorum, with its membranous portion, representing the valve of the foramen ovale, and the entrance to the left auricular appendix.

Left auricle—Atrium sinistrum.—Left ventricle—Ventriculus sinister.

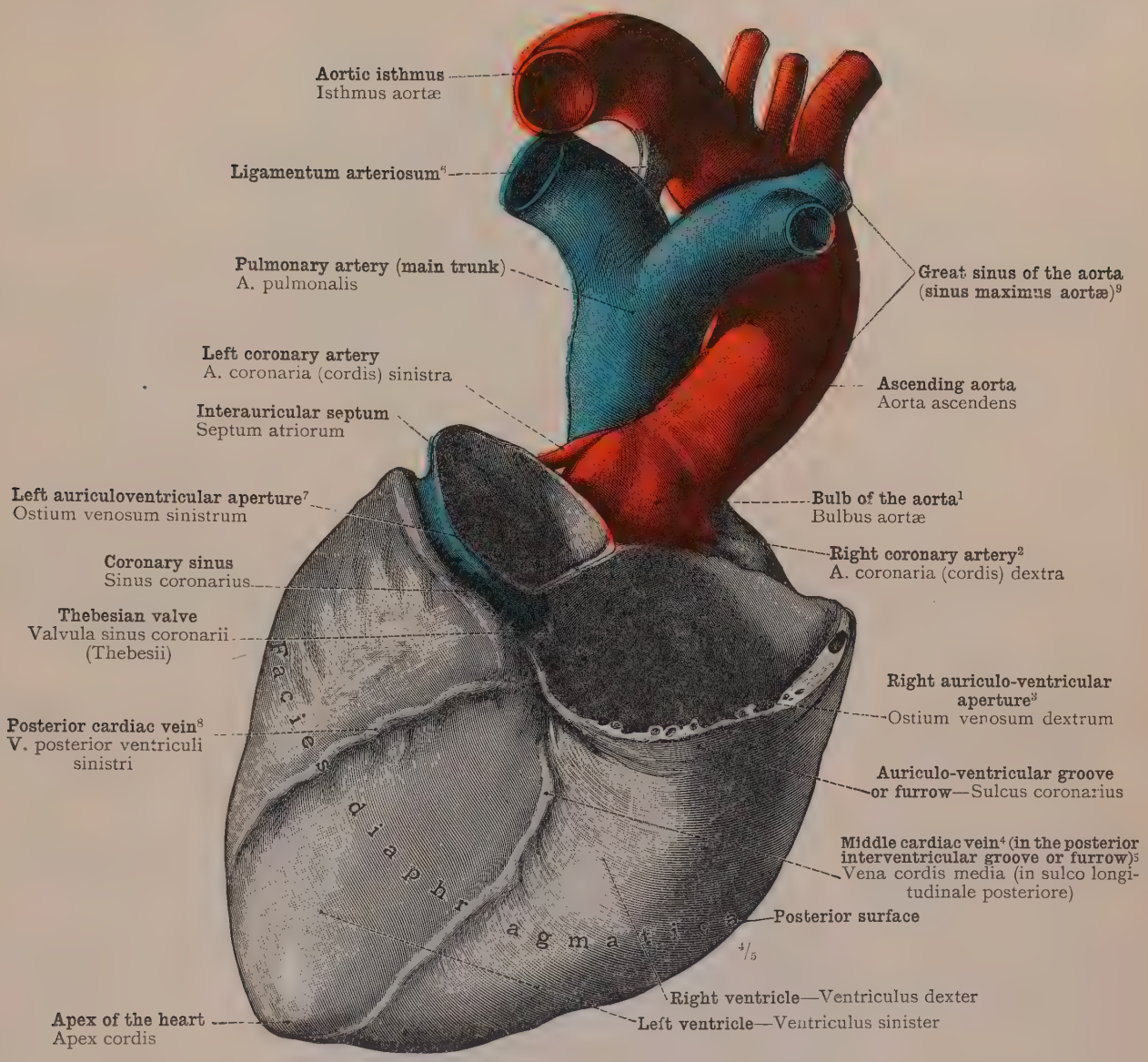


1 See Appendix, note 111.
2 Or junction of the *parietal* and *visceral pericardium*. (See also note 2 to p. 565).—Tr.
3 See Appendix, note 113. 4 See note 2 to p. 564. 5 See note 4 to p. 566.
6 The *membranous part of the interventricular septum* is sometimes spoken of as the *undefended space*.—Tr.
7 See note 5 to p. 564. 8 See note 4 to p. 567. 9 See note 7 to p. 564.

FIG. 950.—THE HEART SEEN FROM BEFORE.

The organ having been hardened in formalin in the distended state (*i.e.*, in diastole), the anterior portion of the *cone of the heart (*i.e.*, the anterior portion of both ventricles—*see Appendix, note* 118), the anterior half of the ascending aorta, and the main trunk of the pulmonary artery nearly as far as the bifurcation, were removed by a coronal section. In the opened *cone of the heart, we see the interventricular septum, at the top of which is the pars membranacea septi, or undefended space (septum membranaceum ventriculorum) ; all the cusps of the mitral and tricuspid valves ; and also the musculi papillares with their chordæ tendineæ. Of the auricles, the right and the left auricular appendices are visible ; and between these and the aorta, on the right, and the main trunk of the pulmonary artery, on the left, the entrances to the transverse sinus of the pericardium. In the aortic orifice (ostium arteriosum sinistrum), the posterior semilunar or sigmoid flap of the aortic valve (*see note* 2 *to p.* 564), with its nodule, or corpus Arantii, and its two lunulæ (*see note* 7 *to p.* 564), is preserved intact. On the anterior surface of the left pulmonary veins, the left pulmonary artery, and the superior vena cava, we see the reflection of the serous layer of the pericardium into the epicardium (*see notes* 1 *and* 2 *to p.* 565).

The Ventricles of the Heart and the Interventricular Septum.



[1] *Bulb of the Aorta.*—This name is often given to the somewhat enlarged portion of the ascending aorta immediately above the aortic valve, which contains the three *sinuses of Valsalva.*—Tr.

[2] See Appendix, note [114].
[3] Or *tricuspid orifice.*
[4] Called by Macalister the *posterior interventricular vein.*
[5] See note [5] to p. 566.
[6] See Appendix, note [111].
[7] Or *mitral orifice.*
[8] Called by Macalister the *left marginal vein.*
[9] See Appendix, note [128].

FIG. 951.—THE POSTERIOR SURFACE, FACIES DIAPHRAGMATICA, OF THE *CONE OF THE HEART (*i.e.*, THE VENTRICULAR PORTION OF THE HEART—*see Appendix, note* [118]), WITH THE MAIN TRUNK OF THE PULMONARY ARTERY AND ITS BIFURCATION, THE ASCENDING AORTA, AND THE ARCH OF THE AORTA. THE BULB OF THE AORTA, BULBUS AORTÆ; THE ORIGIN OF THE CORONARY ARTERIES, RIGHT AND LEFT, ARTERIÆ CORONARIÆ (CORDIS), DEXTRA ET SINISTRA. THE LIGAMENTUM ARTERIOSUM, OR LIGAMENT OF BOTALLO, AND THE AORTIC ISTHMUS, ISTHMUS AORTÆ.

The heart having been hardened in the distended state (*i.e.*, in diastole), the auricles were removed by a section passing immediately above the auriculoventricular groove or furrow (sulcus coronarius), and the coronary sinus was thus laid open as far as the terminal orifice through which it communicates with the right auricle.

The Ventricular Portion of the Heart with the Aorta and the Pulmonary Artery.

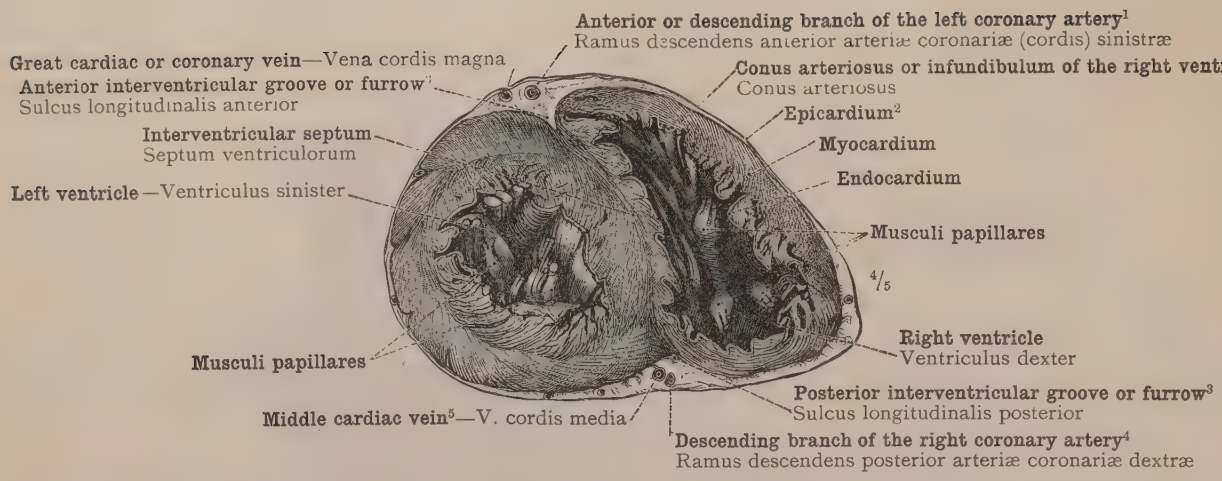
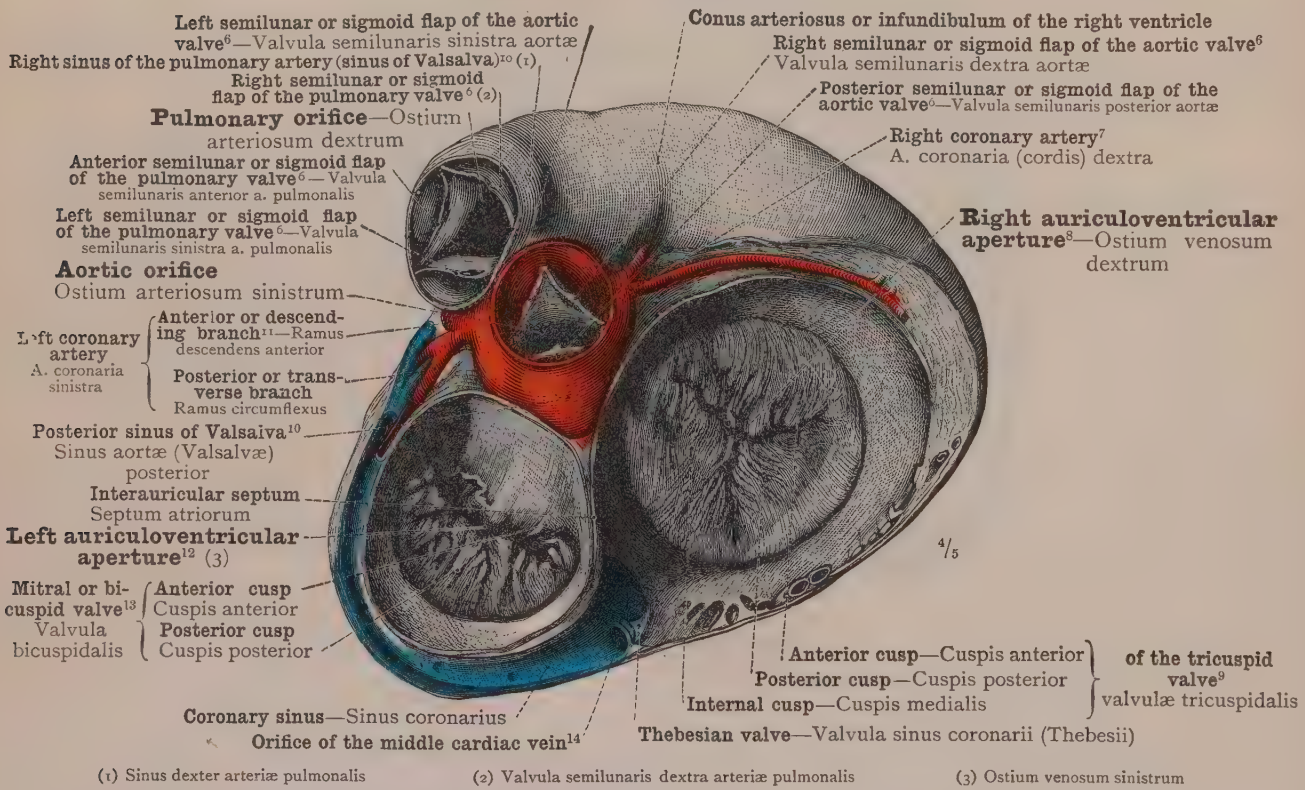


FIG. 952.—THE LOWER HALF OF THE TRANSVERSELY-DIVIDED *CONE OF THE HEART (*i.e.*, THE VENTRICULAR PORTION OF THE HEART—*see Appendix, note* [118]).

On the surface of the section we observe the nearly circular contour of the cavity of the left ventricle, and the sickle-shaped outline of that of the right ventricle; further, that the wall of the heart consists of the heart muscle, or myocardium, lined within by the endocardium, and enveloped without by the epicardium; and, finally, the notably greater thickness of the wall of the left ventricle.


Left semilunar or sigmoid flap of the aortic valve[6]—Valvula semilunaris sinistra aortæ
Conus arteriosus or infundibulum of the right ventricle
Right semilunar or sigmoid flap of the aortic valve[6]
Valvula semilunaris dextra aortæ
Right sinus of the pulmonary artery (sinus of Valsalva)[10] (1)
Right semilunar or sigmoid flap of the pulmonary valve[6] (2)
Posterior semilunar or sigmoid flap of the aortic valve[6]—Valvula semilunaris posterior aortæ
Pulmonary orifice—Ostium arteriosum dextrum
Right coronary artery[7]
A. coronaria (cordis) dextra
Anterior semilunar or sigmoid flap of the pulmonary valve[6]—Valvula semilunaris anterior a. pulmonalis
Left semilunar or sigmoid flap of the pulmonary valve[6]—Valvula semilunaris sinistra a. pulmonalis
Right auriculoventricular aperture[8]—Ostium venosum dextrum
Aortic orifice
Ostium arteriosum sinistrum
Left coronary artery
A. coronaria sinistra
Anterior or descending branch[11]—Ramus descendens anterior
Posterior or transverse branch
Ramus circumflexus
Posterior sinus of Valsalva[10]
Sinus aortæ (Valsalvæ) posterior
Interauricular septum
Septum atriorum
Left auriculoventricular aperture[12] (3)
4/5
Mitral or bicuspid valve[13]
Valvula bicuspidalis
Anterior cusp
Cuspis anterior
Posterior cusp
Cuspis posterior
Anterior cusp—Cuspis anterior
Posterior cusp—Cuspis posterior
Internal cusp—Cuspis medialis
of the tricuspid valve[9]
valvulæ tricuspidalis
Coronary sinus—Sinus coronarius
Orifice of the middle cardiac vein[14]
Thebesian valve—Valvula sinus coronarii (Thebesii)

(1) Sinus dexter arteriæ pulmonalis (2) Valvula semilunaris dextra arteriæ pulmonalis (3) Ostium venosum sinistrum

FIG. 953.—THE RELATIVE POSITION OF THE VALVES AND ORIFICES OF THE HEART, AND ALSO OF THE AORTA AND THE MAIN TRUNK OF THE PULMONARY ARTERY JUST ABOVE THEIR RESPECTIVE VALVES.

The section lays open the coronary sinus along its whole length as well as the adjoining portion of the great cardiac or coronary vein, and displays the Thebesian valve and the orifice of the middle cardiac vein. The valves are in the position that obtains during the cardiac systole, the auriculoventricular valves being closed, the pulmonary and aortic valves open.

1 Called by Macalister the *anterior interventricular artery*. 2 Or *visceral* or *cardiac pericardium*—see note 2 to p. 565.
3 See note 5 to p. 566. 4 Called by Macalister the *posterior interventricular artery*—see Appendix, note [114].
5 Called by Macalister the *posterior interventricular vein*. 6 See note 2 to p. 564. 7 See Appendix, note [114].
8 Or *tricuspid orifice*. 9 See note 5 to p. 564. 10 See Appendix, note [112].
11 Called by Macalister the *anterior interventricular artery*. 12 Or *mitral orifice*. 13 See note 4 to p. 566.
14 Called by Macalister the *posterior interventricular vein*.

The Mutual Relations of the Ventricles of the Heart and of the Cardiac Valves and Orifices.

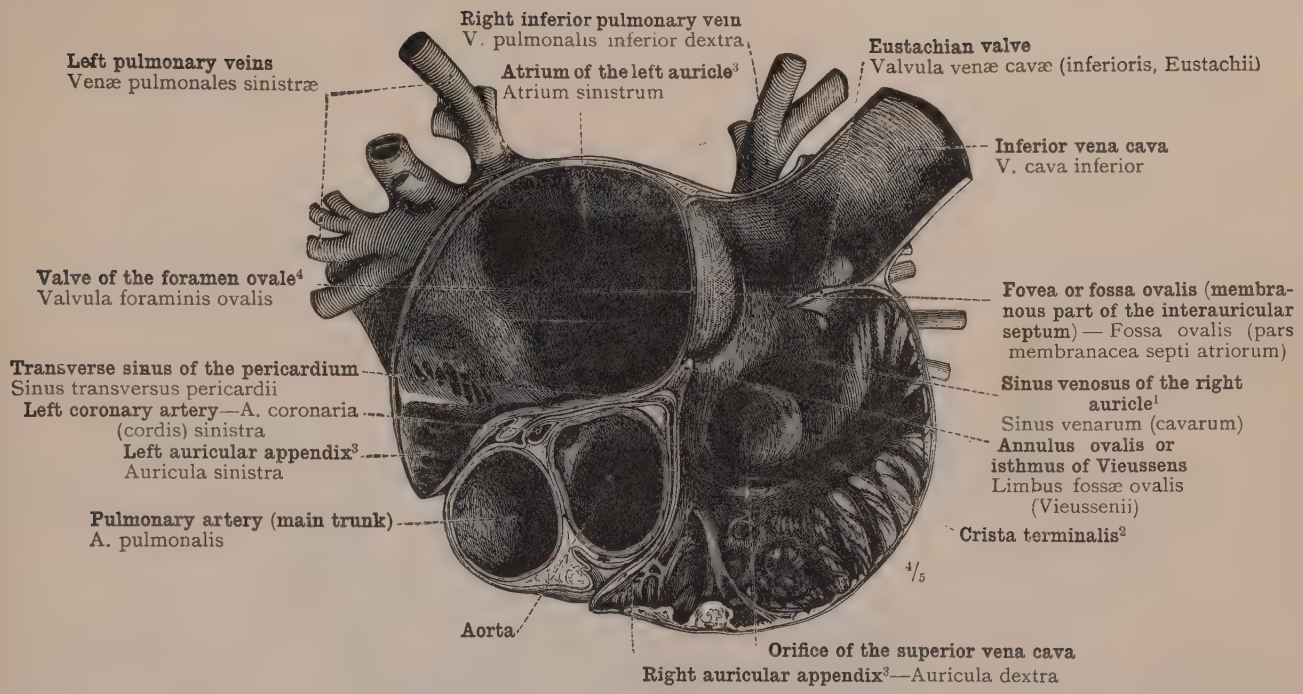

Right inferior pulmonary vein
V. pulmonalis inferior dextra
Left pulmonary veins
Venæ pulmonales sinistræ
Atrium of the left auricle[3]
Atrium sinistrum
Eustachian valve
Valvula venæ cavæ (inferioris, Eustachii)
Inferior vena cava
V. cava inferior
Valve of the foramen ovale[4]
Valvula foraminis ovalis
Fovea or fossa ovalis (membranous part of the interauricular septum) — Fossa ovalis (pars membranacea septi atriorum)
Transverse sinus of the pericardium
Sinus transversus pericardii
Left coronary artery—A. coronaria (cordis) sinistra
Left auricular appendix[3]
Auricula sinistra
Sinus venosus of the right auricle[1]
Sinus venarum (cavarum)
Annulus ovalis or isthmus of Vieussens
Limbus fossæ ovalis (Vieussenii)
Pulmonary artery (main trunk)
A. pulmonalis
Crista terminalis[2]
4/5
Aorta
Orifice of the superior vena cava
Right auricular appendix[3]—Auricula dextra

FIG. 954.—SINUS TRANSVERSUS PERICARDII, THE TRANSVERSE SINUS OF THE PERICARDIUM. MUSCULI PECTINATI AND CRISTA TERMINALIS OF THE RIGHT AURICLE[2]. SINUS VENOSUS[2]. THE MEMBRANOUS PART OF THE INTERAURICULAR SEPTUM.

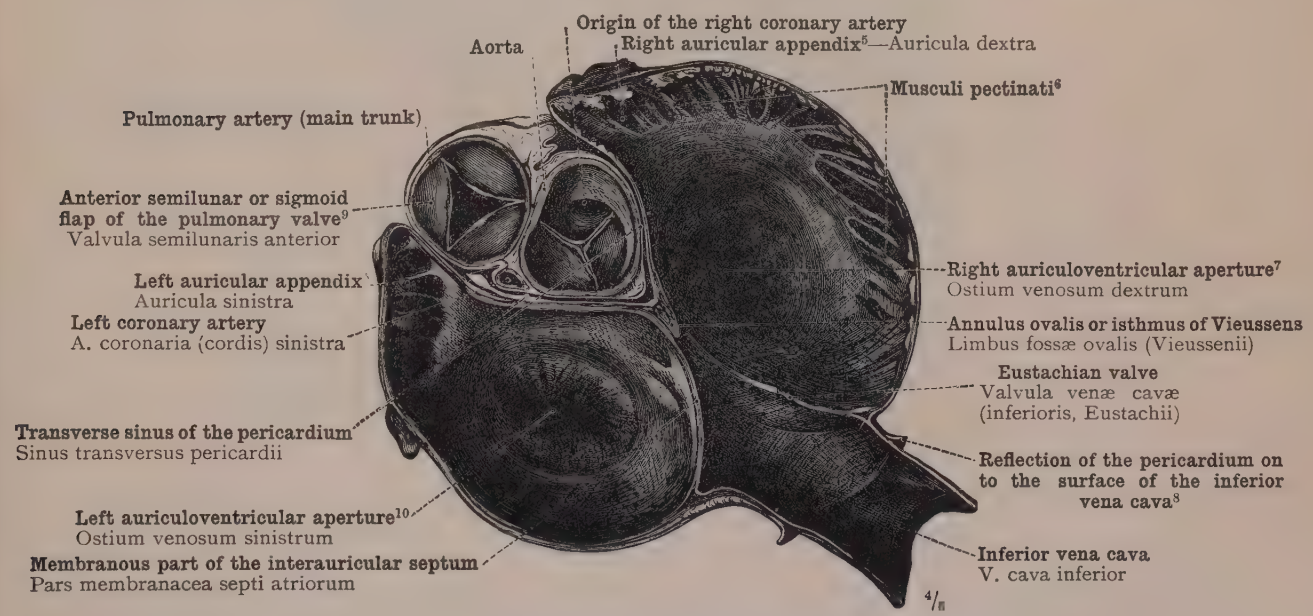

Origin of the right coronary artery
Aorta
Right auricular appendix[5]—Auricula dextra
Musculi pectinati[6]
Pulmonary artery (main trunk)
Anterior semilunar or sigmoid flap of the pulmonary valve[9]
Valvula semilunaris anterior
Left auricular appendix
Auricula sinistra
Left coronary artery
A. coronaria (cordis) sinistra
Right auriculoventricular aperture[7]
Ostium venosum dextrum
Annulus ovalis or isthmus of Vieussens
Limbus fossæ ovalis (Vieussenii)
Eustachian valve
Valvula venæ cavæ (inferioris, Eustachii)
Transverse sinus of the pericardium
Sinus transversus pericardii
Reflection of the pericardium on to the surface of the inferior vena cava[8]
Left auriculoventricular aperture[10]
Ostium venosum sinistrum
Membranous part of the interauricular septum
Pars membranacea septi atriorum
Inferior vena cava
V. cava inferior
4/5

FIG. 955.—THE SEMILUNAR OR SIGMOID FLAPS OF THE AORTIC AND PULMONARY VALVES, WITH THEIR NODULES, OR CORPORA ARANTII (NODULI VALVULARUM SEMILUNARUM). THE MEMBRANOUS PART OF THE INTERAURICULAR SEPTUM AND THE EUSTACHIAN VALVE.

The auricular portion of the heart was removed by a section passing through both auricular appendices, through the root of the aorta and of the pulmonary artery, and hemisecting the orifice and the proximal portion of the inferior vena cava. In Fig. 954 the upper segment, and in Fig. 955 the lower segment, of the heart is shown.

1 See Appendix, note 115.

2 *Crista Terminalis.*—This forms the boundary between the smooth wall of the *sinus venosus* (see Appendix, note 115) and the fasciculated wall of the rest of the auricle. The fasciculi themselves are called *musculi pectinati*. The inward projection of the *crista terminalis* (called by Macalister *tænia terminalis*) corresponds to the *sulcus terminalis* seen on the outside of the wall of the auricle (see Fig. 945, p. 563).

3 See Appendix, note 113.

4 Called by Macalister *valvula sinistra sacci venosi*.

5 See Appendix, note 113.

6 See note 2 above.

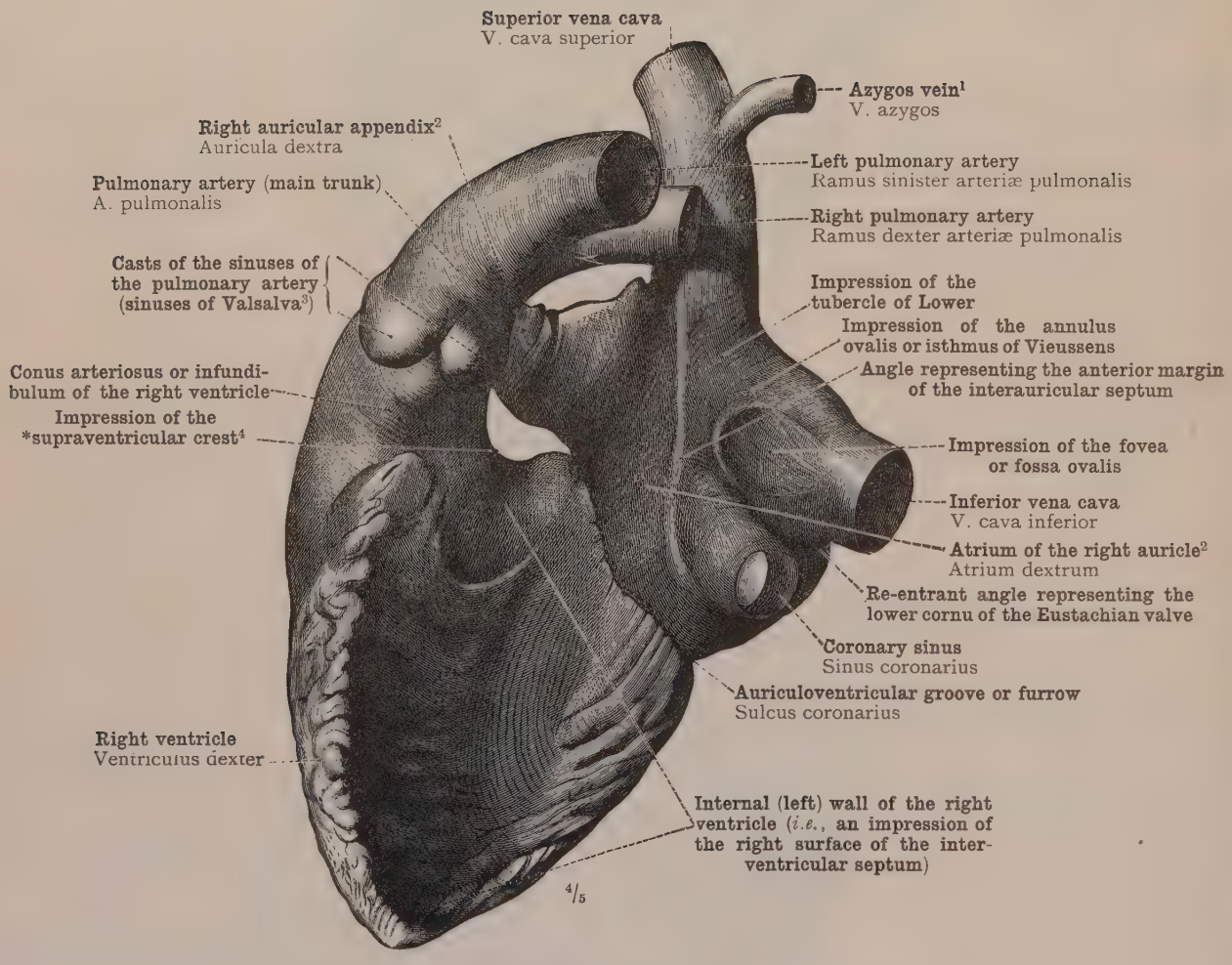
7 Or *tricuspid orifice*.

8 Or junction of the *parietal* and *visceral pericardium*—see note 2 to p. 565.

9 See note 2 to p. 564.

10 Or *mitral orifice*.

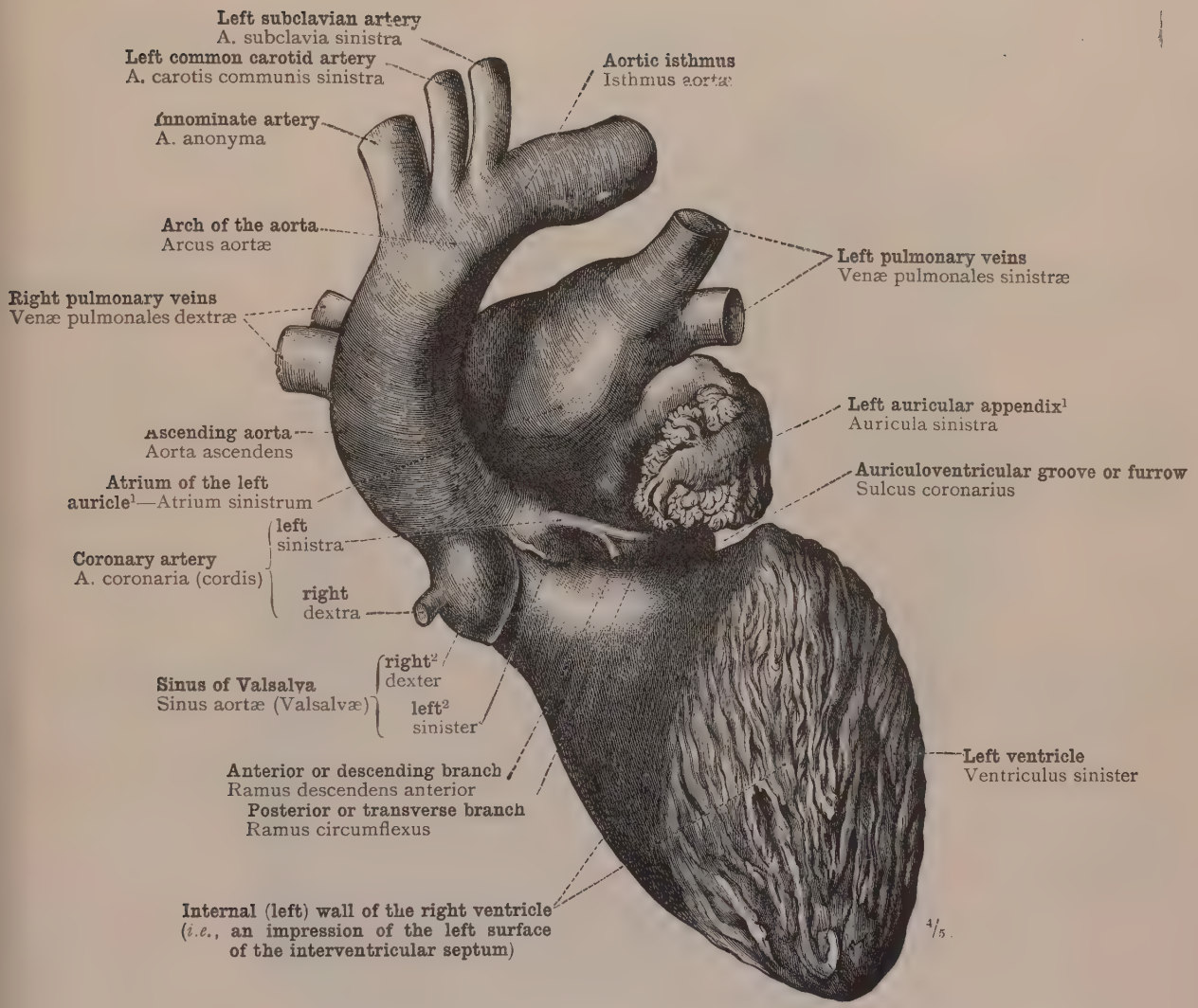
The Mutual Relations of the Auricles, the Aorta, and the Main Trunk of the Pulmonary Artery.


Superior vena cava
V. cava superior
Azygos vein[1]
V. azygos
Right auricular appendix[2]
Auricula dextra
Left pulmonary artery
Ramus sinister arteriæ pulmonalis
Pulmonary artery (main trunk)
A. pulmonalis
Right pulmonary artery
Ramus dexter arteriæ pulmonalis
Casts of the sinuses of the pulmonary artery (sinuses of Valsalva[3])
Impression of the tubercle of Lower
Impression of the annulus ovalis or isthmus of Vieussens
Angle representing the anterior margin of the interauricular septum
Conus arteriosus or infundibulum of the right ventricle
Impression of the *supraventricular crest[4]
Impression of the fovea or fossa ovalis
Inferior vena cava
V. cava inferior
Atrium of the right auricle[2]
Atrium dextrum
Re-entrant angle representing the lower cornu of the Eustachian valve
Coronary sinus
Sinus coronarius
Auriculoventricular groove or furrow
Sulcus coronarius
Right ventricle
Ventriculus dexter
Internal (left) wall of the right ventricle (i.e., an impression of the right surface of the interventricular septum)
4/5

1 Called also the *right* or *large azygos vein*. 2 See Appendix, note [113]. 3 See Appendix, note [112]. 4 See note 4 to p. 564.

FIG. 956.—CAST OF THE INTERIOR OF THE RIGHT SIDE OF THE HEART, WITH THE MAIN TRUNK AND THE BIFURCATION OF THE PULMONARY ARTERY, THE PROXIMAL EXTREMITIES OF THE SUPERIOR AND INFERIOR VENÆ CAVÆ, AND THE CORONARY SINUS, SEEN FROM THE INNER SIDE.

The Configuration of the Right Side of the Heart.



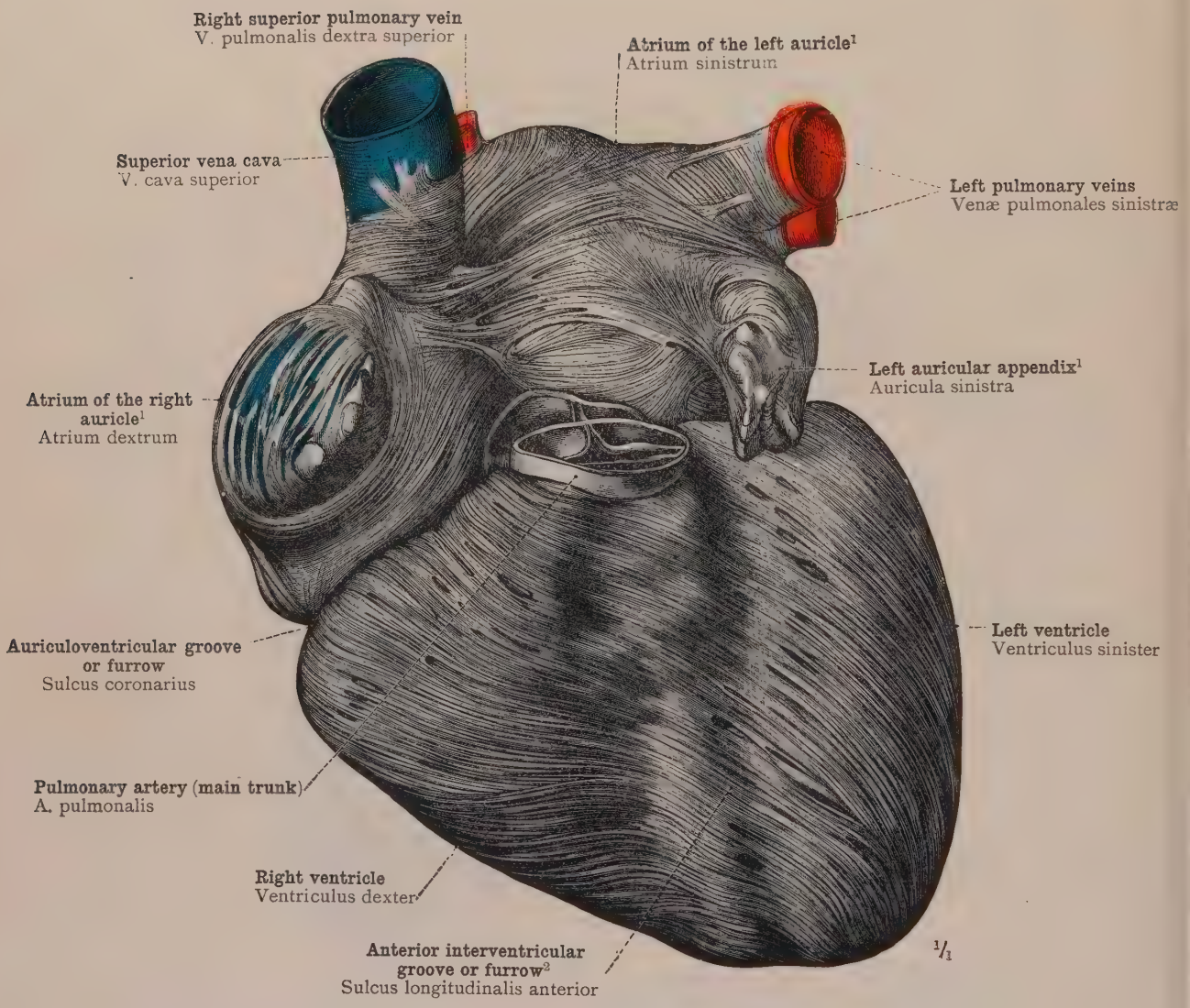
[1] See Appendix, note 113.

[2] Regarding the position and nomenclature of the several sinuses of Valsalva, the same considerations apply as regarding the several semilunar or sigmoid flaps of the aortic valve—see note [2] to p. 564.—Tr.

[3] Called by Macalister the *anterior interventricular artery*.

FIG. 957.—CAST OF THE INTERIOR OF THE LEFT SIDE OF THE HEART, WITH THE AORTA TO A POINT A LITTLE BEYOND THE ISTHMUS, THE COMMENCEMENT OF THE CORONARY ARTERIES, AND THE PROXIMAL EXTREMITIES OF THE SUPERIOR AND INFERIOR VENÆ CAVÆ, SEEN FROM THE INNER SIDE.

The Configuration of the Left Side of the Heart.



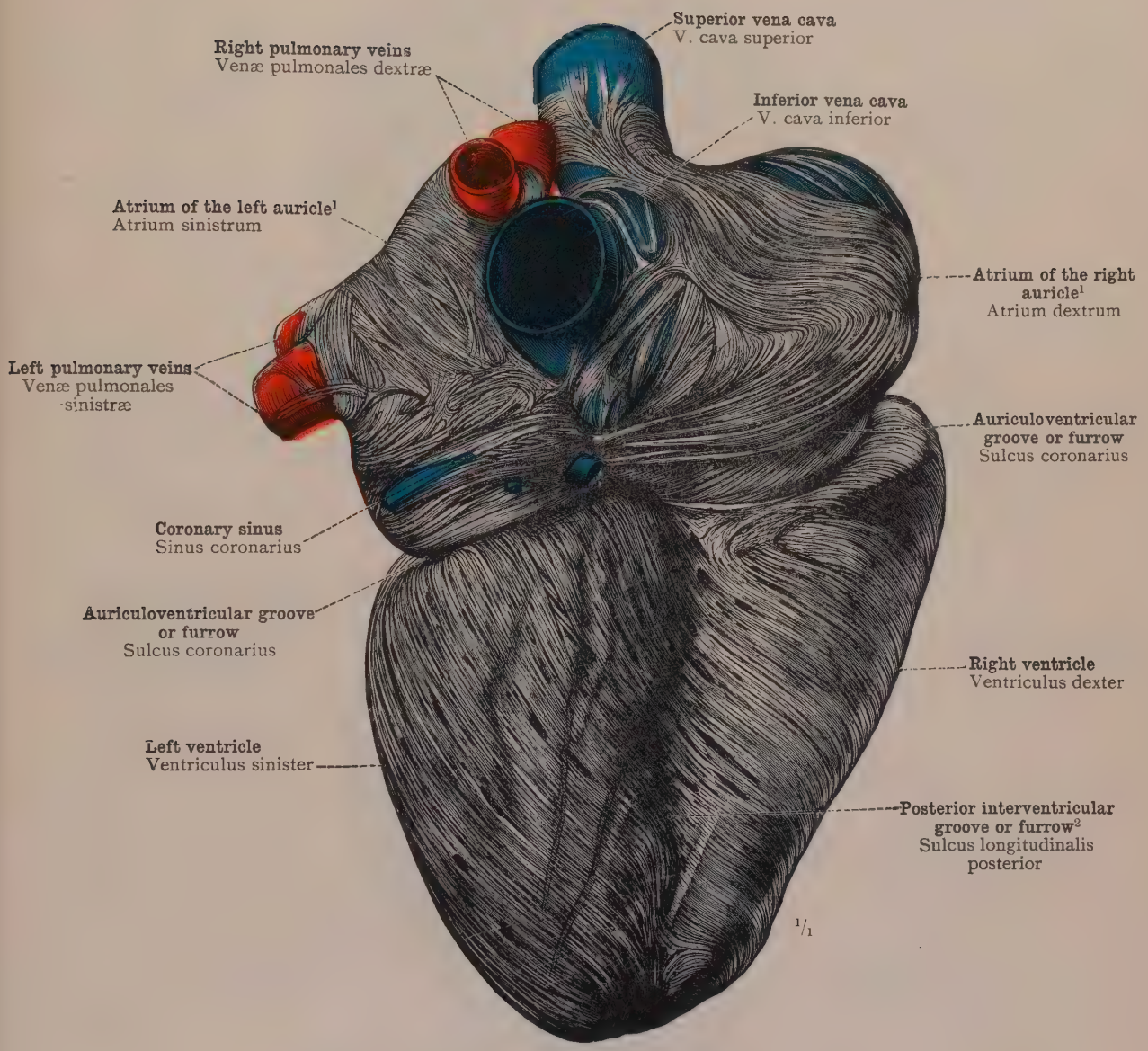
[1] See Appendix, note 113.

[2] See note 5 to p. 566.

FIG. 958.—SUPERFICIAL FIBRES OF THE MYOCARDIUM ON THE ANTERIOR SURFACE OF THE VENTRICLES AND AURICLES.

The heart was injected with tallow prior to dissection.

The Myocardium.



[1] See Appendix, note [113].

[2] See note 5 to p. 566.

FIG. 959.—SUPERFICIAL FIBRES OF THE MYOCARDIUM ON THE POSTERIOR SURFACE OF THE VENTRICLES AND AURICLES.

The preparation shown in Fig. 958, seen from behind.

The Myocardium.

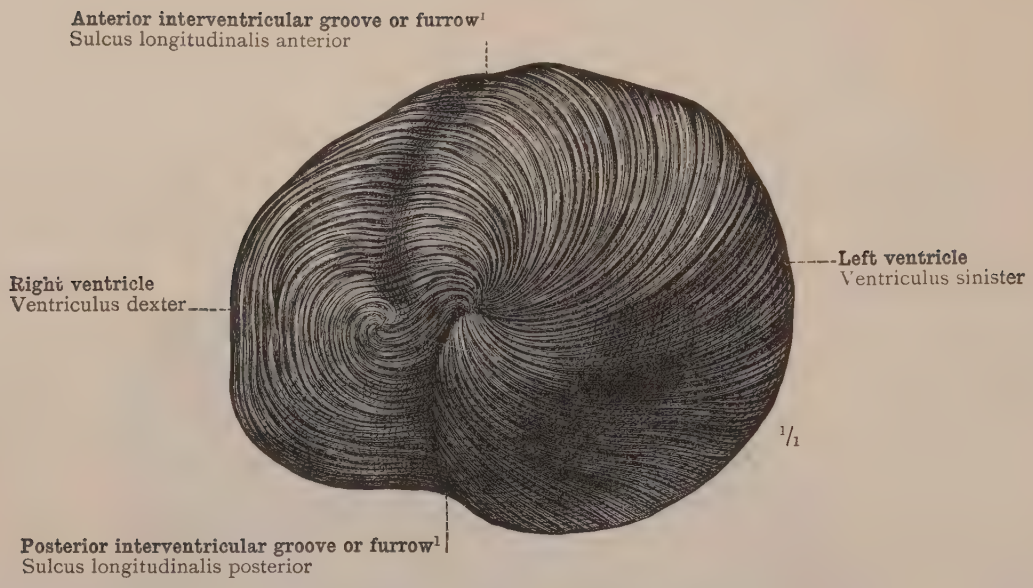


FIG. 960.—VORTEX OR WHORL OF THE HEART, VORTEX CORDIS, AT THE APEX OF THE *CONE OF THE HEART (*i.e.*, OF THE VENTRICULAR PORTION OF THE HEART—*see note* [12] *to p.* 563); SEEN FROM BELOW.

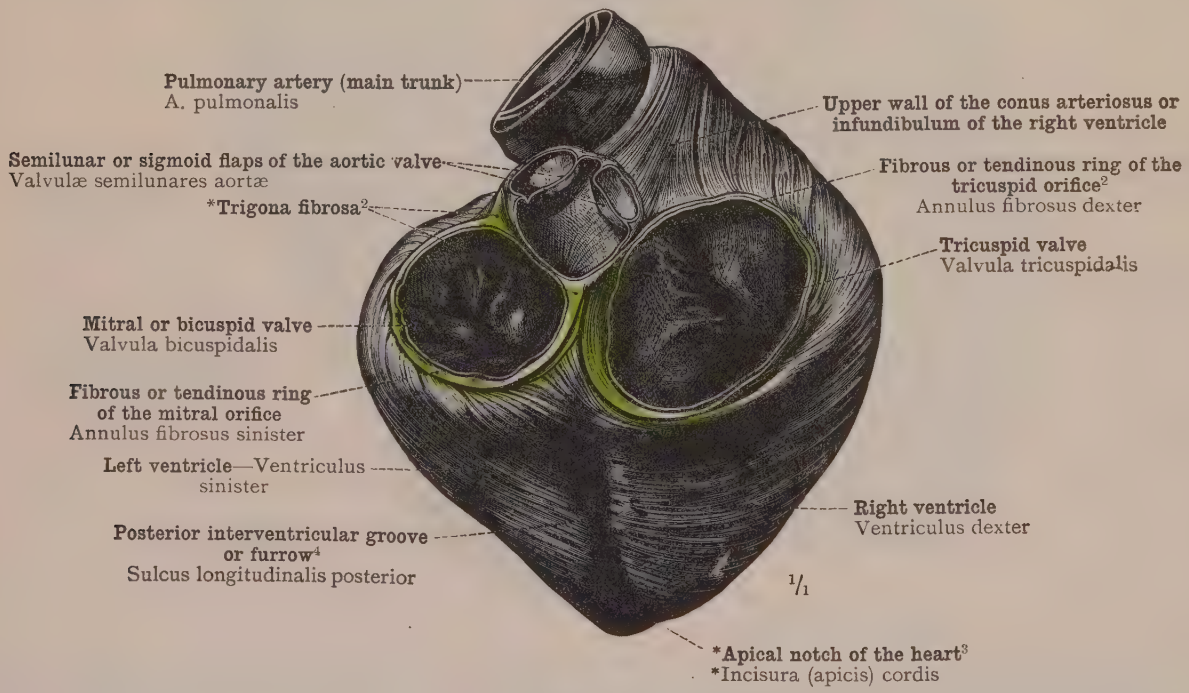

Pulmonary artery (main trunk)
A. pulmonalis
Upper wall of the conus arteriosus or infundibulum of the right ventricle
Semilunar or sigmoid flaps of the aortic valve
Valvulæ semilunares aortæ
Fibrous or tendinous ring of the tricuspid orifice[2]
Annulus fibrosus dexter
*Trigona fibrosa[2]
Tricuspid valve
Valvula tricuspidalis
Mitral or bicuspid valve
Valvula bicuspidalis
Fibrous or tendinous ring of the mitral orifice
Annulus fibrosus sinister
Left ventricle—Ventriculus sinister
Right ventricle
Ventriculus dexter
Posterior interventricular groove or furrow[4]
Sulcus longitudinalis posterior
1/1
*Apical notch of the heart[3]
*Incisura (apicis) cordis

FIG. 961.—THE *CONE OF THE HEART (*i.e.*, THE VENTRICULAR PORTION OF THE HEART—*see note* [12] *to p.* 563) SEEN FROM ABOVE AND BEHIND, WITH THE SUPERFICIAL FIBRES OF THE MYOCARDIUM LAID BARE; THE FIBROUS OR TENDINOUS RINGS OF THE AURICULOVENTRICULAR APERTURES, ANNULI FIBROSI, AND THE *TRIGONA FIBROSA.[2]

[1] See note 5 to p. 566.

[2] *Annuli Fibrosi and *Trigona Fibrosa.*—The *fibrous* or *tendinous rings* of the auriculoventricular apertures are by Macalister called *zonæ tendinosæ*. Connected with these are the **trigona fibrosa* (the term is not used by English anatomists). These are strong triangular masses of fibrocartilage. The *right *trigonum fibrosum*, situated in the angle between the aortic and the two auriculoventricular openings, corresponds to the *os cordis* of certain mammals, such as the ox. The *left *trigonum fibrosum* lies in front of the mitral orifice, in the angle between that orifice and the left side of the aortic orifice.—TR.

[3] See note 5 to p. 562.

[4] See note 5 to p. 566.

Vortex cordis—Vortex or whorl of the heart.—Annuli fibrosi—Fibrous or tendinous rings of the auriculoventricular apertures.

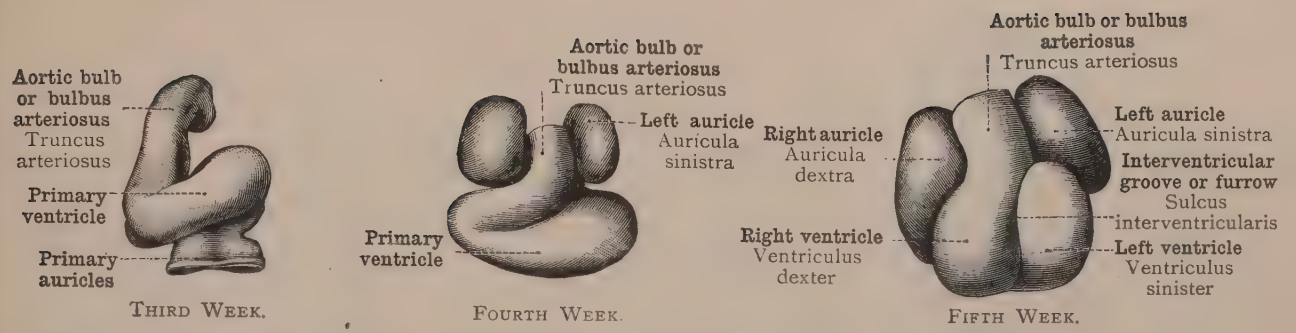
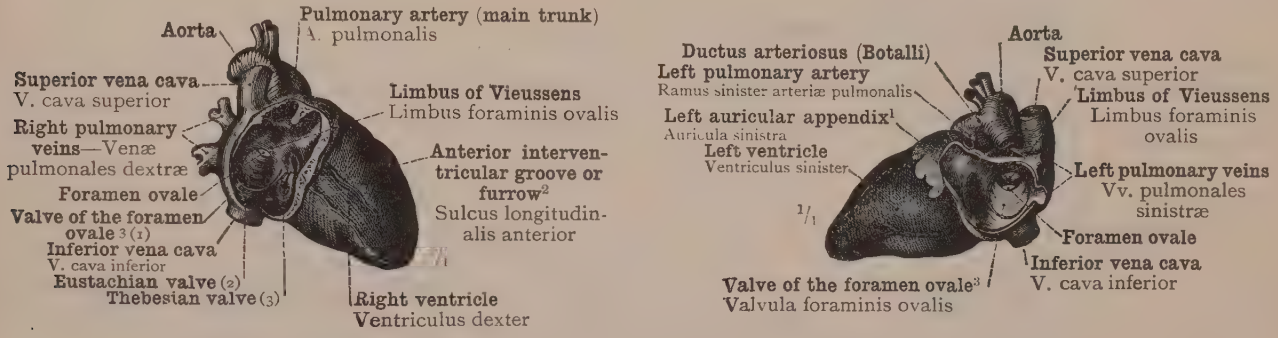


Fig. 962.—Stages in the Development of the Human Heart in the First Weeks of Intra-uterine Life. (Enlarged. After W. His.)



(1) Valvula foraminis ovalis (2) Valvula venæ cavæ (inferioris, Eustachii) (3) Valvula sinus coronarii (Thebesii)

Fig. 963.—Foramen Ovale Septi Atriorum, the Foramen Ovale of the Interauricular Septum, as seen in the Heart of a Human Fœtus at the End of the Sixth Month (Months of Four Weeks Each) when the Free (Outer) Walls of Both Auricles have been removed.

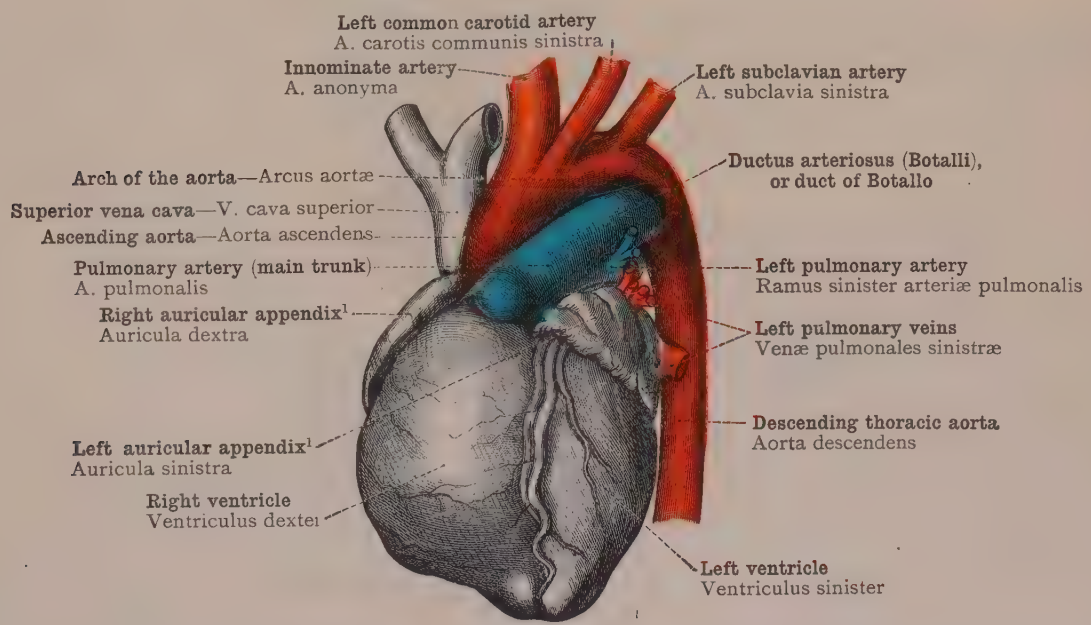


Fig. 964.—The Heart (injected) of an Infant born at Full Term, seen from the Left Side and Before.

The ductus arteriosus or duct of Botallo is seen to be directly continuous with the main trunk of the pulmonary artery.

1 See Appendix, note 113.
2 See note 5 to p. 506.
3 Called by Macalister *valvula sinistra sacci venosi.*

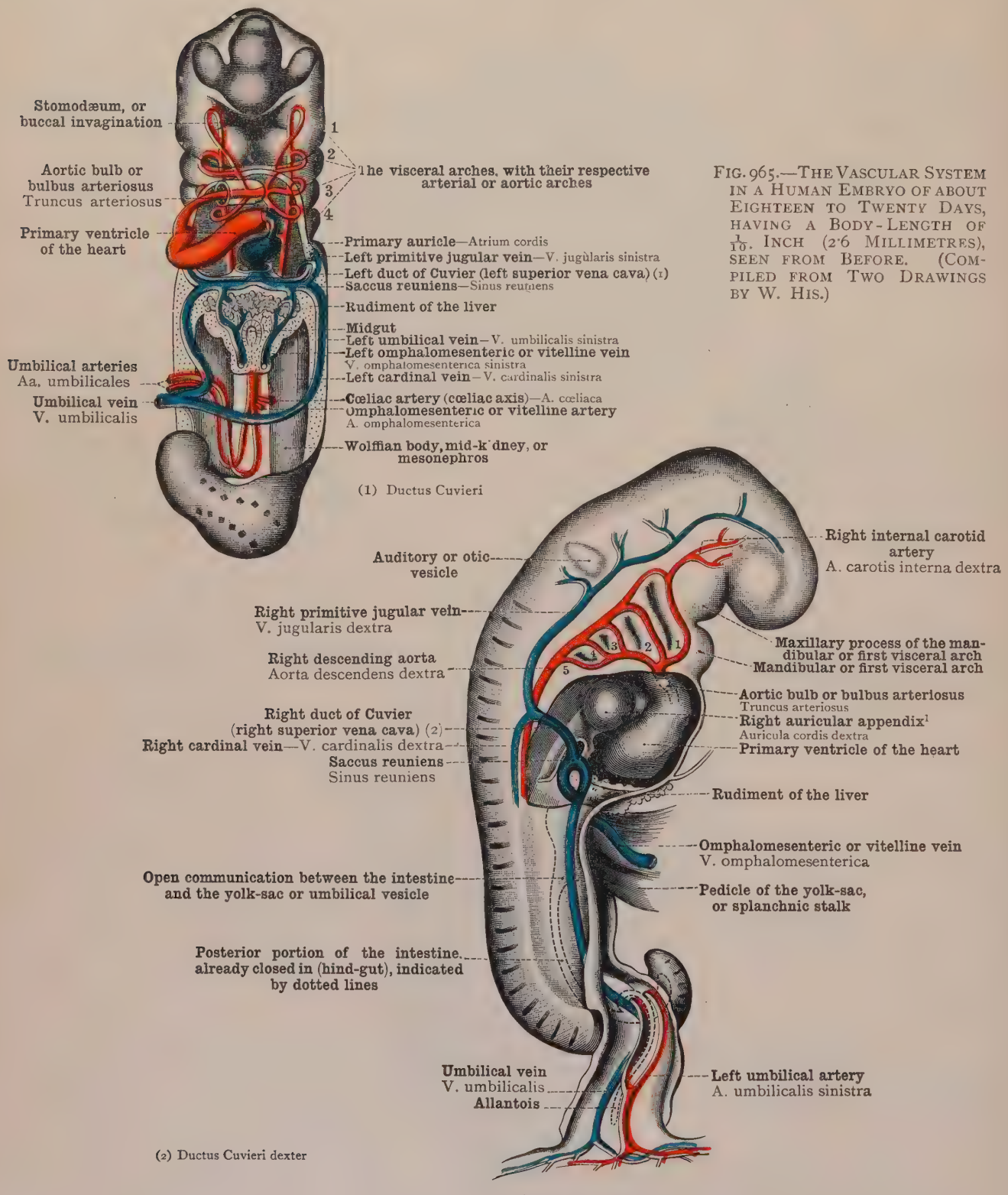


FIG. 965.—THE VASCULAR SYSTEM IN A HUMAN EMBRYO OF ABOUT EIGHTEEN TO TWENTY DAYS, HAVING A BODY-LENGTH OF $\frac{1}{10}$. INCH (2·6 MILLIMETRES), SEEN FROM BEFORE. (COMPILED FROM TWO DRAWINGS BY W. HIS.)

[1] See Appendix, note [113].

FIG. 966.—CONDITION OF THE HEART AND VASCULAR SYSTEM IN A HUMAN EMBRYO OF THE TWENTY-SECOND OR TWENTY-THIRD DAY, HAVING A BODY-LENGTH OF $\frac{1}{6}$ INCH (4·2 MILLIMETRES), SEEN FROM THE RIGHT SIDE. (AFTER W. HIS.)

The Vascular System at the End of the Third and in the Beginning of the Fourth Week of Intra-uterine Life.

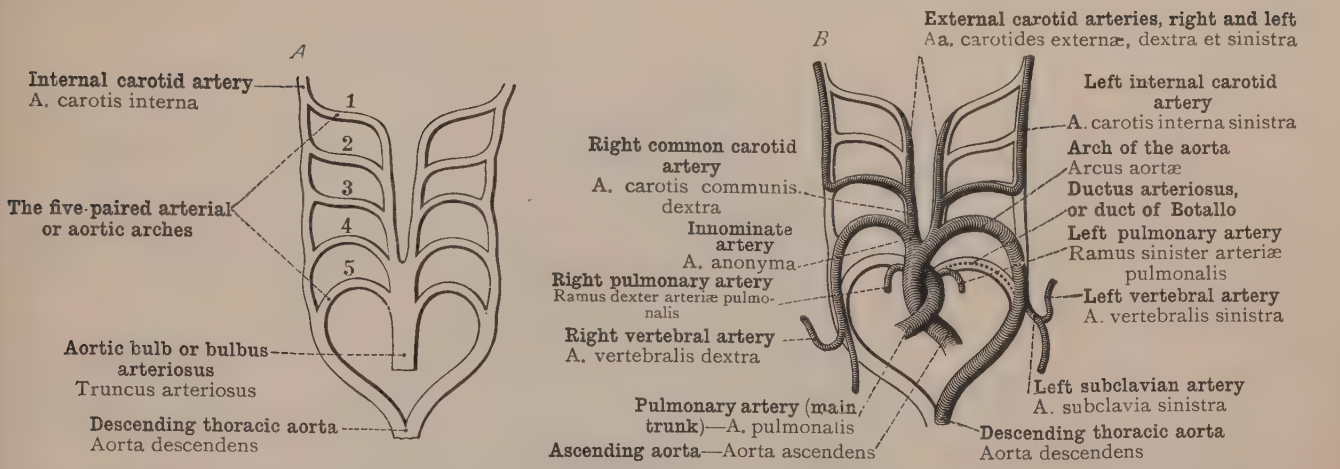


FIG. 967.—DIAGRAMMATIC REPRESENTATION OF THE TRANSFORMATION OF THE ARTERIAL OR AORTIC ARCHES. *A*. THEIR ORIGINAL ARRANGEMENT. *B*. THEIR SUBSEQUENT TRANSFORMATION INTO THE PERMANENT ARTERIAL TRUNKS. (AFTER RATHKE, WITH A SLIGHT MODIFICATION BY F. HOCHSTETTER.)

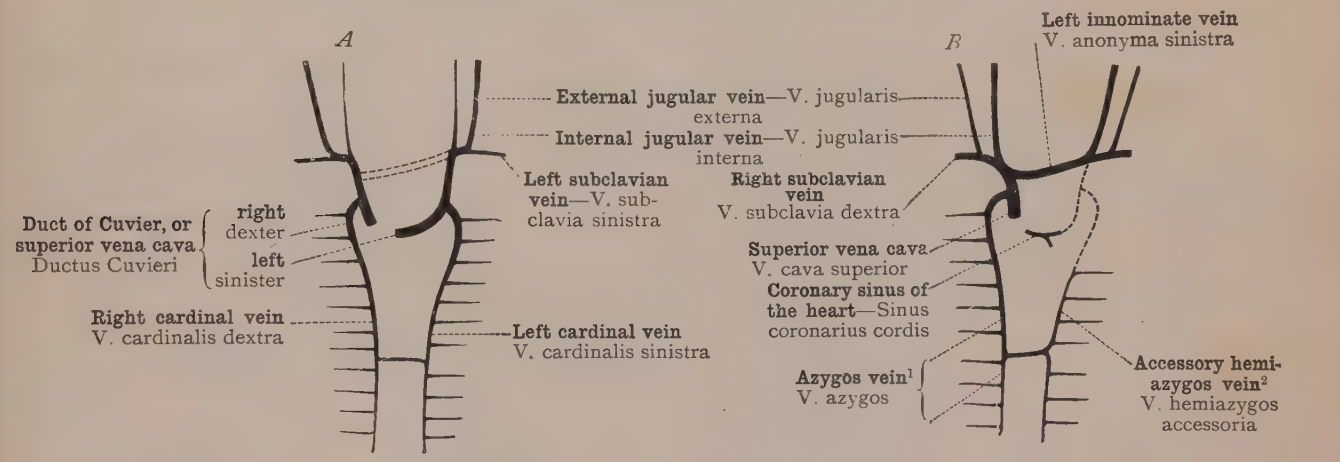


FIG. 968.—DIAGRAMMATIC REPRESENTATION OF THE RUDIMENTARY ARRANGEMENT OF THE SYSTEMIC SYSTEM OF VEINS (*A*), AND OF THE TRANSFORMATION OF THE SYSTEM OF THE SUPERIOR VENÆ CAVÆ (*B*). (AFTER RATHKE, WITH MODIFICATIONS BY F. HOCHSTETTER.)

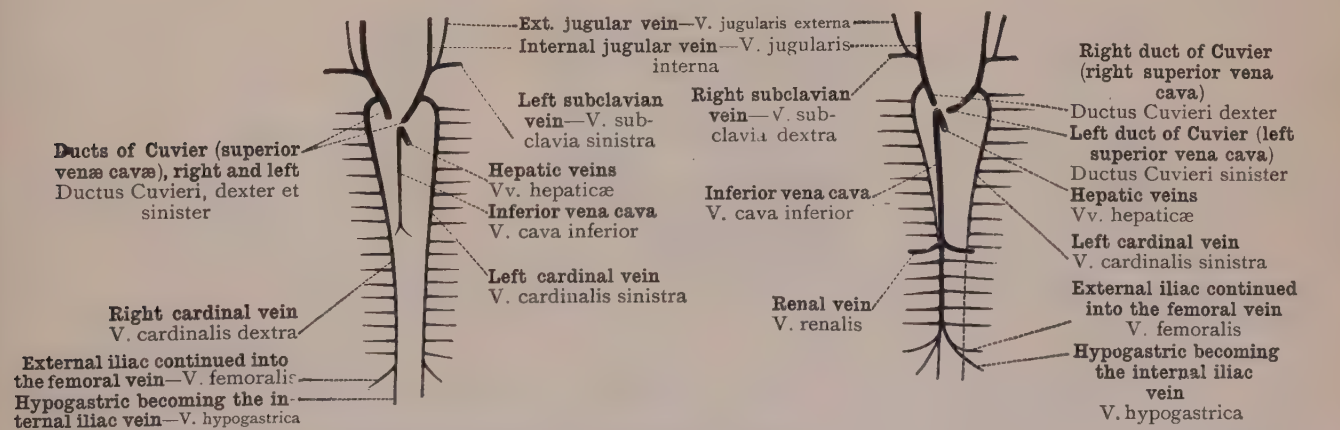
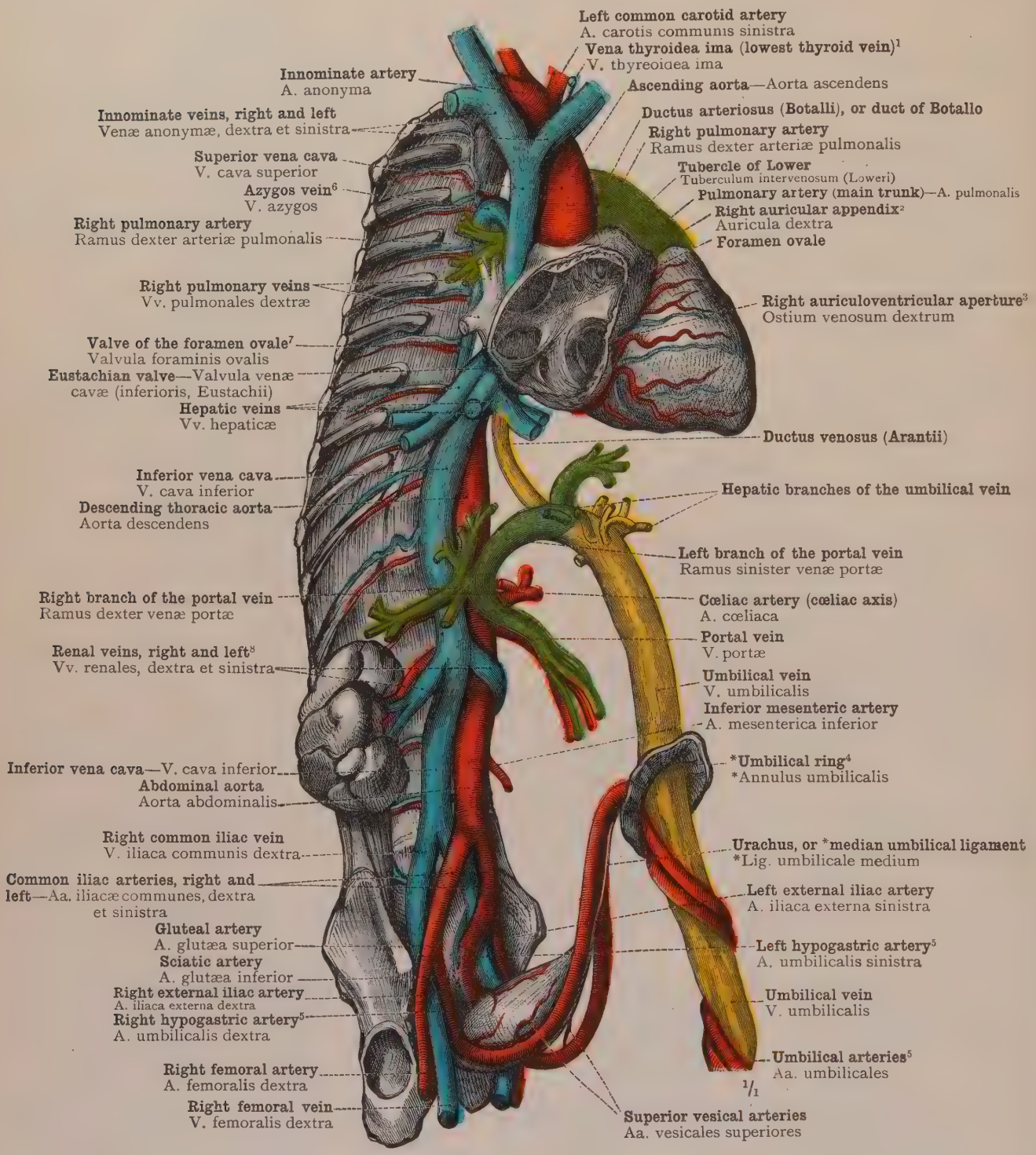

Ext. jugular vein—V. jugularis externa
Internal jugular vein—V. jugularis interna
Left subclavian vein—V. subclavia sinistra
Right subclavian vein—V. subclavia dextra
Right duct of Cuvier (right superior vena cava)
Ductus Cuvieri dexter
Ducts of Cuvier (superior venæ cavæ), right and left
Ductus Cuvieri, dexter et sinister
Left duct of Cuvier (left superior vena cava)
Ductus Cuvieri sinister
Hepatic veins
Vv. hepaticæ
Inferior vena cava
V. cava inferior
Hepatic veins
Vv. hepaticæ
Inferior vena cava
V. cava inferior
Left cardinal vein
V. cardinalis sinistra
Left cardinal vein
V. cardinalis sinistra
Renal vein
V. renalis
External iliac continued into the femoral vein
V. femoralis
Right cardinal vein
V. cardinalis dextra
External iliac continued into the femoral vein—V. femoralis
Hypogastric becoming the internal iliac vein
V. hypogastrica
Hypogastric becoming the internal iliac vein—V. hypogastrica

FIG. 969.—DIAGRAMMATIC REPRESENTATION OF THE DEVELOPMENT OF THE INFERIOR VENA CAVA. (AFTER RATHKE, IMPROVED BY F. HOCHSTETTER.)

[1] Called also the *right* or *large azygos vein*.

[2] Called also the *left upper azygos vein*.

The Rudimentary Condition of the Arterial and Venous Systems, and the Transformations by which the Normal Adult Condition of these Systems is attained.

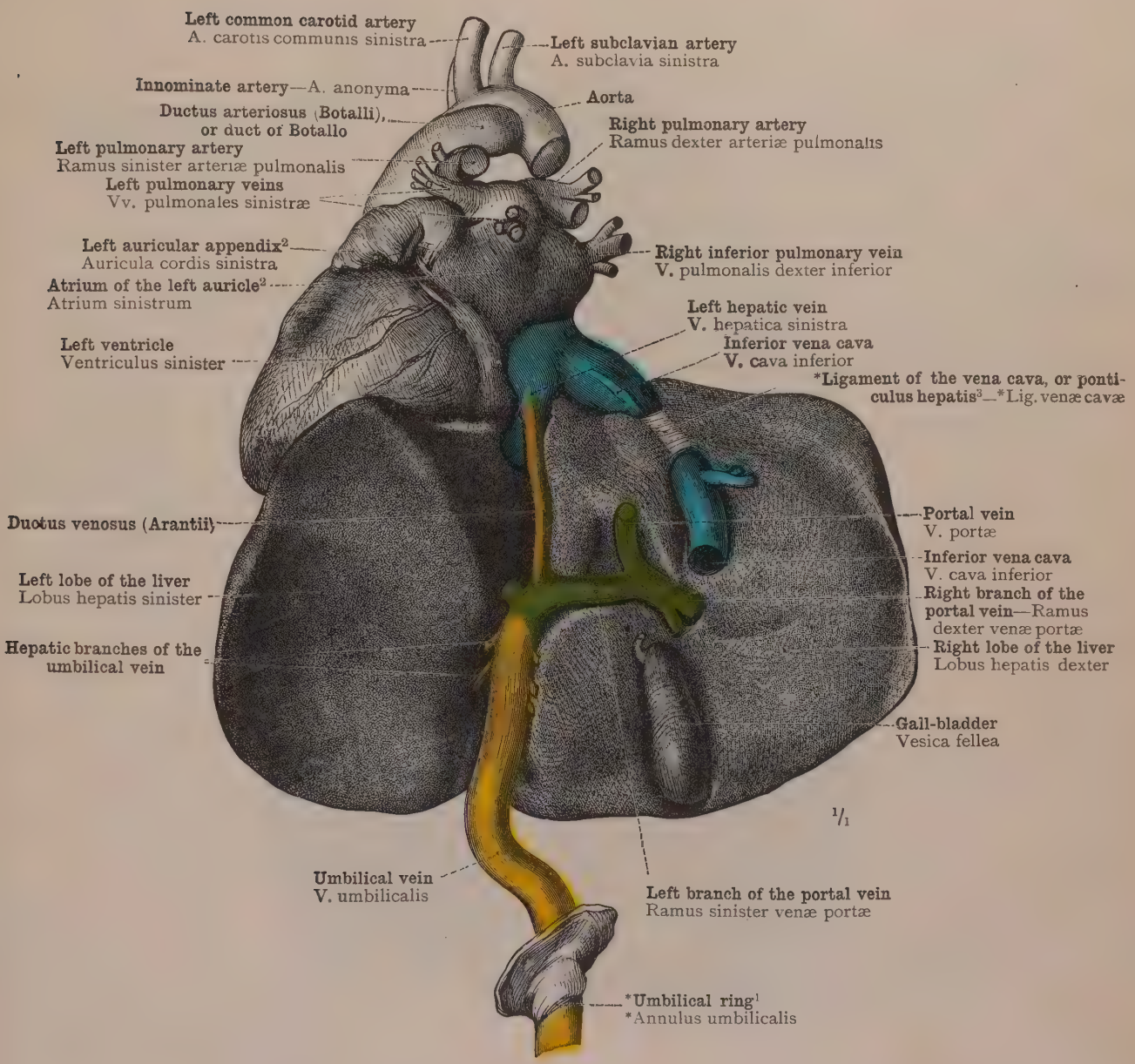


[1] Companion to the *thyroidea ima artery*—see note [1] to p. 590.—Tr.
[2] See Appendix, note [113].
[3] Or *tricuspid orifice.*
[4] See Appendix, note [119].
[5] See Appendix, note [120].
[6] Called also the *right* or *large azygos vein.*
[7] Called by Macalister *valvula sinistra sacci venosi.*
[8] Sometimes called the *emulgent* veins. See note 3 to p. 595.—Tr.

FIG. 970.—THE CIRCULATORY APPARATUS OF THE FŒTUS, AS SEEN IN AN INFANT STILL-BORN AT FULL TERM. VIEWED FROM THE RIGHT SIDE.

The right wall of the right auricle has been removed, to show the foramen ovale and its valve, and also the Eustachian valve. The umbilical vein with its hepatic branches and the ductus venosus (Arantii) are coloured yellow; the portal vein, the pulmonary arteries, and the ductus arteriosus (Botalli), are coloured green.

The Fœtal Circulatory Apparatus.

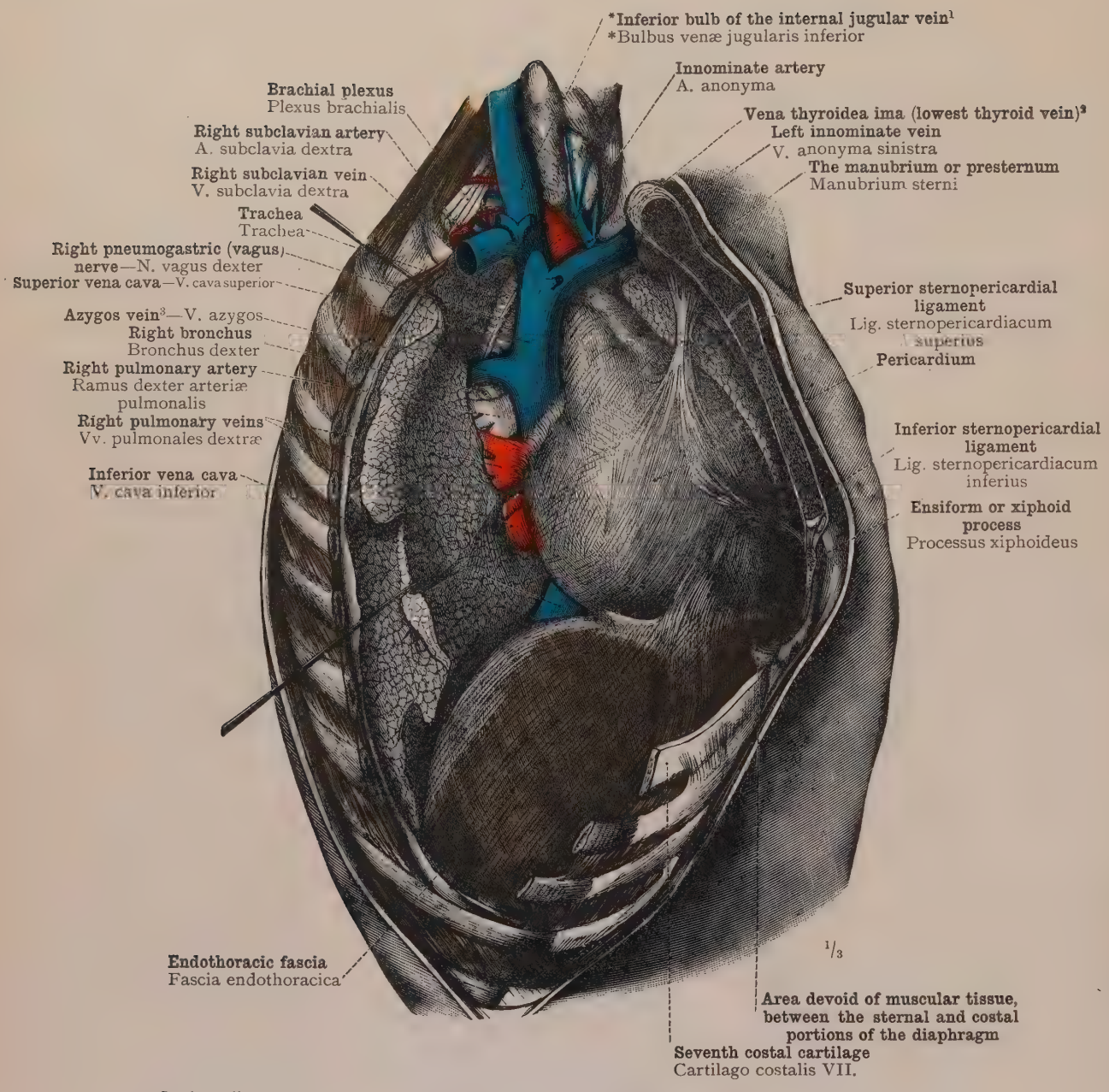


[1] See Appendix note [119]. [2] See Appendix, note [113]. [3] See Appendix, to Part IV., note [17].

FIG. 971.—THE LIVER AND THE HEART OF AN INFANT STILL-BORN AT FULL TERM. THE UMBILICAL VEIN, VENA UMBILICALIS, FROM THE *UMBILICAL RING (*see Appendix, note* [119]) TO ITS TERMINATION IN THE LEFT BRANCH OF THE PORTAL VEIN, AND THE HEPATIC BRANCHES GIVEN OFF FROM THE UMBILICAL VEIN IN THE UMBILICAL FISSURE OF THE LIVER; THE DIVISION OF THE PORTAL VEIN, VENA PORTÆ, INTO ITS RIGHT AND LEFT BRANCHES; THE ORIGIN OF THE DUCTUS VENOSUS (ARANTII) IN THE LEFT BRANCH OF THE PORTAL VEIN, AND ITS TERMINATION IN THE LEFT HEPATIC VEIN.

The liver is represented as seen from below; the heart, as seen from behind. The short remaining portion of the trunk of the portal vein has been turned upwards.

The Fœtal Circulation in Relation to the Liver.



[1] See Appendix, note 121.

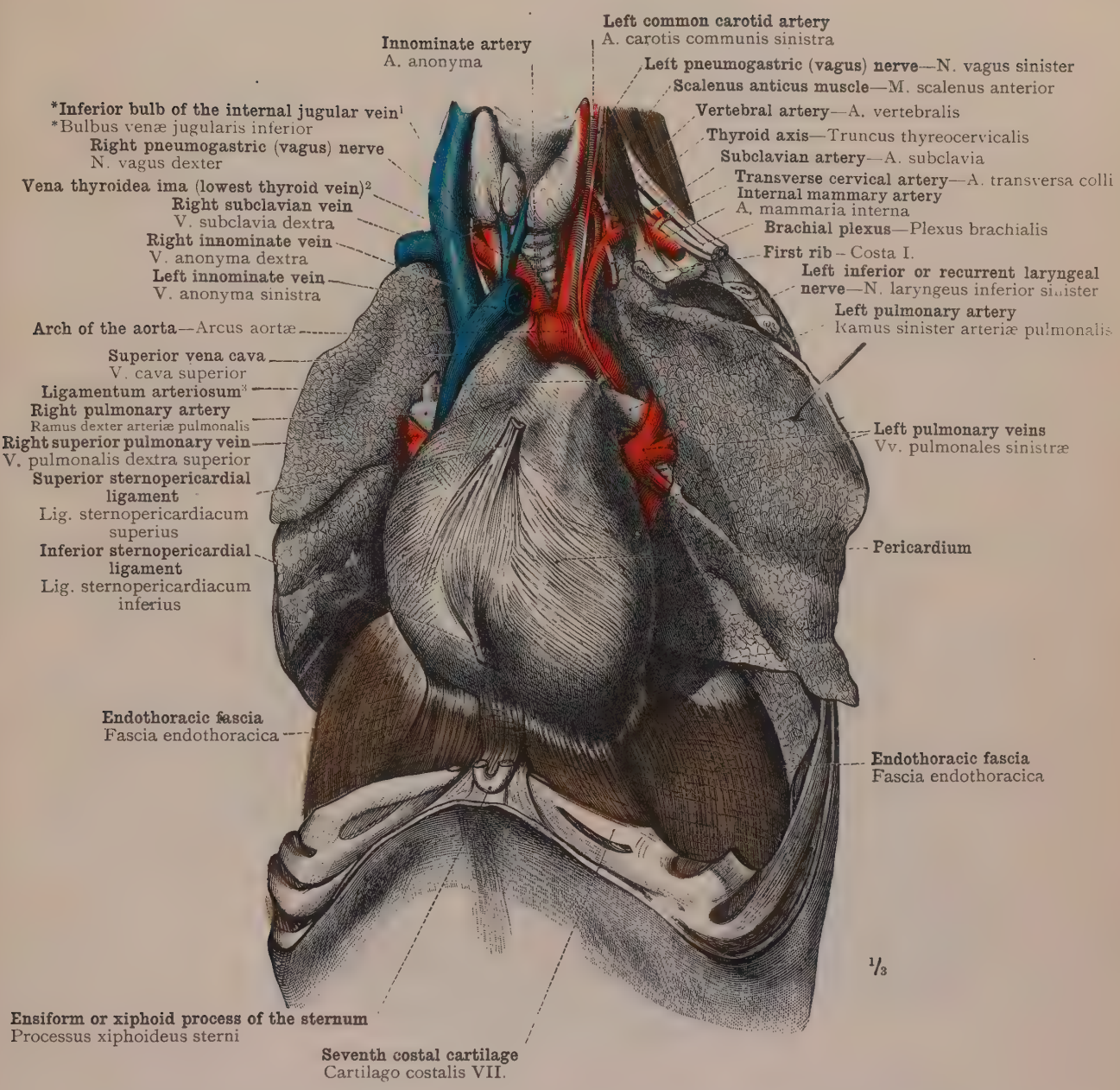
[2] Companion to the *thyroidea ima artery*—see note [1] to p. 590.—Tr.

[3] Called also the *right* or *large azygos vein*.

FIG. 972.—POSITION AND RELATIONS OF THE PERICARDIUM; ITS CONNEXIONS WITH THE ENDOTHORACIC FASCIA AND WITH THE DIAPHRAGM. PROLONGATION OF THE FIBROUS LAYER OF THE PERICARDIUM TO FORM TUBULAR INVESTMENTS FOR THE AORTA, THE SUPERIOR VENA CAVA, AND THE RIGHT PULMONARY VEINS. THE SUPERIOR AND INFERIOR STERNOPERICARDIAL LIGAMENTS. SEEN FROM THE RIGHT SIDE AND BEFORE.

The sternum having been divided sagittally in the median plane, its left half was drawn a little forwards; the right wall of the thorax was removed as far down as the tenth rib; and the right lung was drawn backwards as far as possible, in order to display the vessels forming its root.

The Pericardium.—The Sternopericardial Ligaments.



[1] See Appendix, note [121].

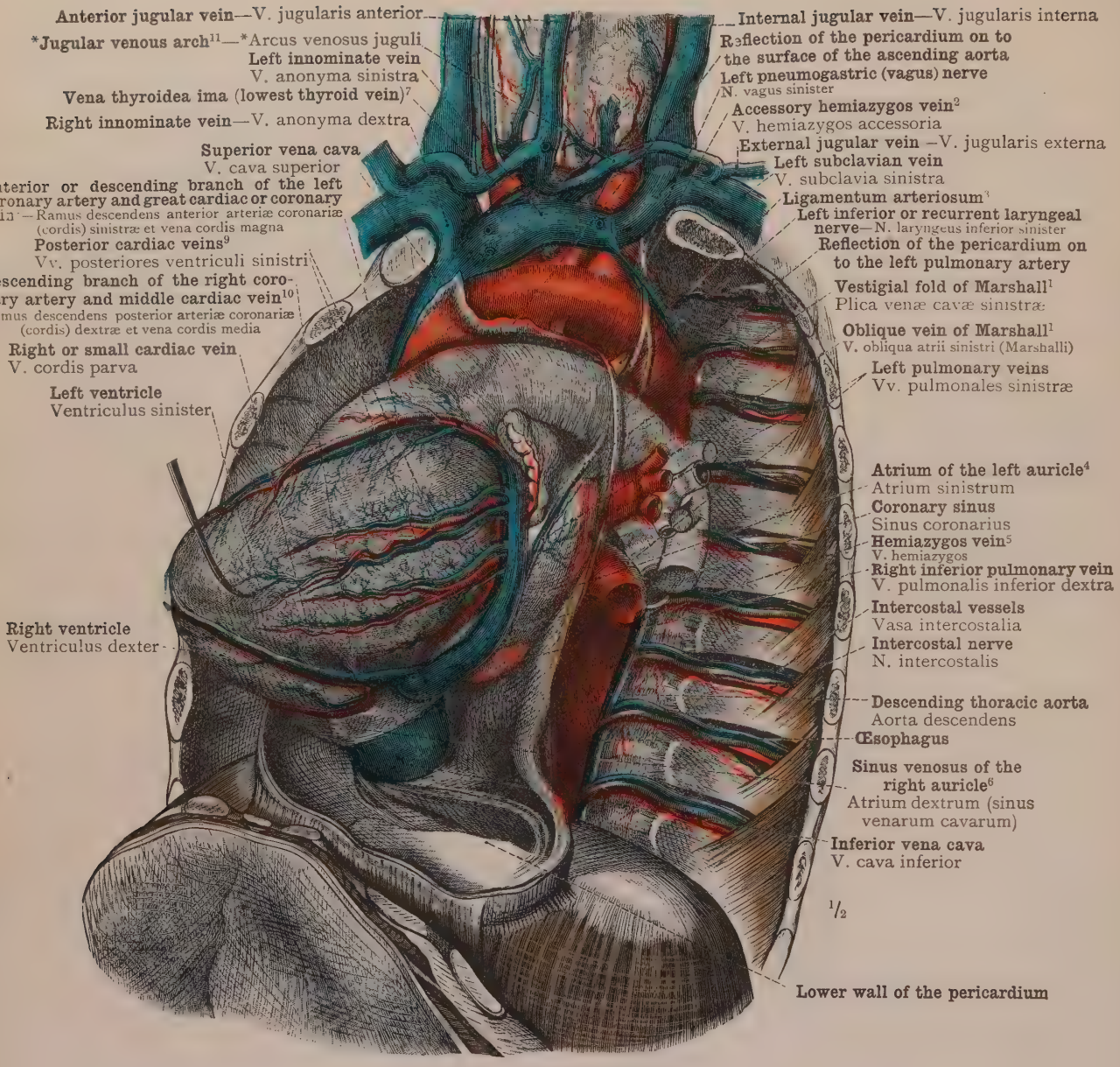
[2] Companion to the *thyroidea ima artery*—see note [1] to p. 590.—Tr.

[3] See Appendix, note [111].

FIG. 973.—POSITION AND RELATIONS OF THE PERICARDIUM; ITS CONNEXIONS WITH THE ENDOTHORACIC FASCIA AND WITH THE DIAPHRAGM; PROLONGATION OF ITS FIBROUS LAYER TO FORM TUBULAR INVESTMENTS FOR THE ARCH OF THE AORTA, THE LEFT PULMONARY ARTERY, AND THE LEFT PULMONARY VEINS. ON THE ANTERIOR WALL OF THE PERICARDIUM, THE REMAINS OF THE STERNOPERICARDIAL LIGAMENTS, WHICH HAVE BEEN DIVIDED, ARE VISIBLE. SEEN FROM THE LEFT SIDE AND BEFORE.

In the preparation shown in Fig. 972, the left wall of the thorax was removed to the same extent as the right wall had already been cut away, and both lungs were drawn backwards as far as possible, in order to display the vessels of the roots of the lungs.

The Pericardium.—The Sternopericardial Ligaments.

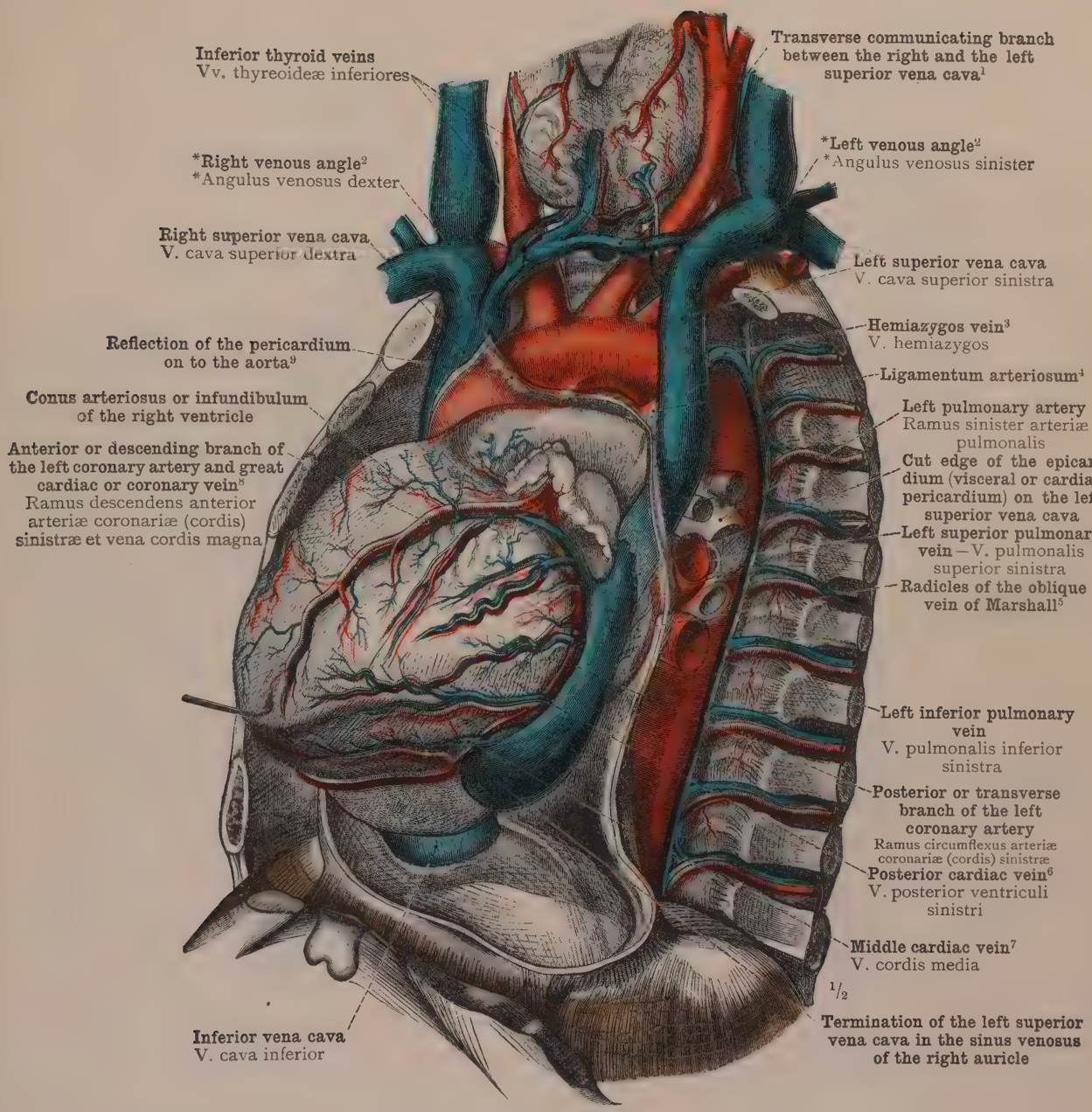

Anterior jugular vein—V. jugularis anterior
*Jugular venous arch[11]—*Arcus venosus juguli
Left innominate vein
V. anonyma sinistra
Vena thyroidea ima (lowest thyroid vein)[7]
Right innominate vein—V. anonyma dextra
Superior vena cava
V. cava superior
Anterior or descending branch of the left coronary artery and great cardiac or coronary vein—Ramus descendens anterior arteriæ coronariæ (cordis) sinistræ et vena cordis magna
Posterior cardiac veins[9]
Vv. posteriores ventriculi sinistri
Descending branch of the right coronary artery and middle cardiac vein[10]
Ramus descendens posterior arteriæ coronariæ (cordis) dextræ et vena cordis media
Right or small cardiac vein
V. cordis parva
Left ventricle
Ventriculus sinister
Right ventricle
Ventriculus dexter
Internal jugular vein—V. jugularis interna
Reflection of the pericardium on to the surface of the ascending aorta
Left pneumogastric (vagus) nerve
N. vagus sinister
Accessory hemiazygos vein[2]
V. hemiazygos accessoria
External jugular vein—V. jugularis externa
Left subclavian vein
V. subclavia sinistra
Ligamentum arteriosum[3]
Left inferior or recurrent laryngeal nerve—N. laryngeus inferior sinister
Reflection of the pericardium on to the left pulmonary artery
Vestigial fold of Marshall[1]
Plica venæ cavæ sinistræ
Oblique vein of Marshall[1]
V. obliqua atrii sinistri (Marshalli)
Left pulmonary veins
Vv. pulmonales sinistræ
Atrium of the left auricle[4]
Atrium sinistrum
Coronary sinus
Sinus coronarius
Hemiazygos vein[5]
V. hemiazygos
Right inferior pulmonary vein
V. pulmonalis inferior dextra
Intercostal vessels
Vasa intercostalia
Intercostal nerve
N. intercostalis
Descending thoracic aorta
Aorta descendens
Œsophagus
Sinus venosus of the right auricle[6]
Atrium dextrum (sinus venarum cavarum)
Inferior vena cava
V. cava inferior
1/2
Lower wall of the pericardium

1 See Appendix, note 122.
2 Called also the *left upper azygos vein.*
3 See Appendix, note 111.
4 See Appendix, note 113.
5 Known also as the *left lower* or *small azygos vein.*
6 See Appendix, note 115.
7 Companion to the *thyroidea ima artery*—see note 1 to p. 590.—Tr.
8 Called by Macalister the *anterior interventricular artery* and *vein.*
9 Called by Macalister the *left marginal veins.*
10 Called by Macalister the *posterior interventricular artery* and *vein.*
11 See Appendix, note 123.

FIG. 974.—THE VESTIGIAL FOLD (PLICA VENÆ CAVÆ SINISTRÆ—*see Appendix, note* 122), AND ITS RELATION TO THE OBLIQUE VEIN OF MARSHALL (VENA OBLIQUA ATRII SINISTRI MARSHALLI—*see Appendix, note* 115). SEEN FROM BEFORE, BELOW, AND THE LEFT SIDE.

The sternum having been removed and the greater part of the left lateral wall of the thorax having been cut away, the front and the left side of the pericardium were removed by incisions passing along the attachments of the membrane to the great vessels and to the diaphragm. The heart was drawn upwards and to the right, in order to display its posterior surface (facies diaphragmatica). The coronary vessels were dissected out by partial removal of the epicardium (visceral or cardiac pericardium).

Pericardium, Epicardium, Vestigial Fold, Cardiac Veins.


Inferior thyroid veins
Vv. thyreoideæ inferiores
*Right venous angle[2]
*Angulus venosus dexter
Right superior vena cava
V. cava superior dextra
Reflection of the pericardium on to the aorta[9]
Conus arteriosus or infundibulum of the right ventricle
Anterior or descending branch of the left coronary artery and great cardiac or coronary vein[8]
Ramus descendens anterior arteriæ coronariæ (cordis) sinistræ et vena cordis magna
Inferior vena cava
V. cava inferior
Transverse communicating branch between the right and the left superior vena cava[1]
*Left venous angle[2]
*Angulus venosus sinister
Left superior vena cava
V. cava superior sinistra
Hemiazygos vein[3]
V. hemiazygos
Ligamentum arteriosum[4]
Left pulmonary artery
Ramus sinister arteriæ pulmonalis
Cut edge of the epicardium (visceral or cardiac pericardium) on the left superior vena cava
Left superior pulmonary vein—V. pulmonalis superior sinistra
Radicles of the oblique vein of Marshall[5]
Left inferior pulmonary vein
V. pulmonalis inferior sinistra
Posterior or transverse branch of the left coronary artery
Ramus circumflexus arteriæ coronariæ (cordis) sinistræ
Posterior cardiac vein[6]
V. posterior ventriculi sinistri
Middle cardiac vein[7]
V. cordis media
1/2
Termination of the left superior vena cava in the sinus venosus of the right auricle

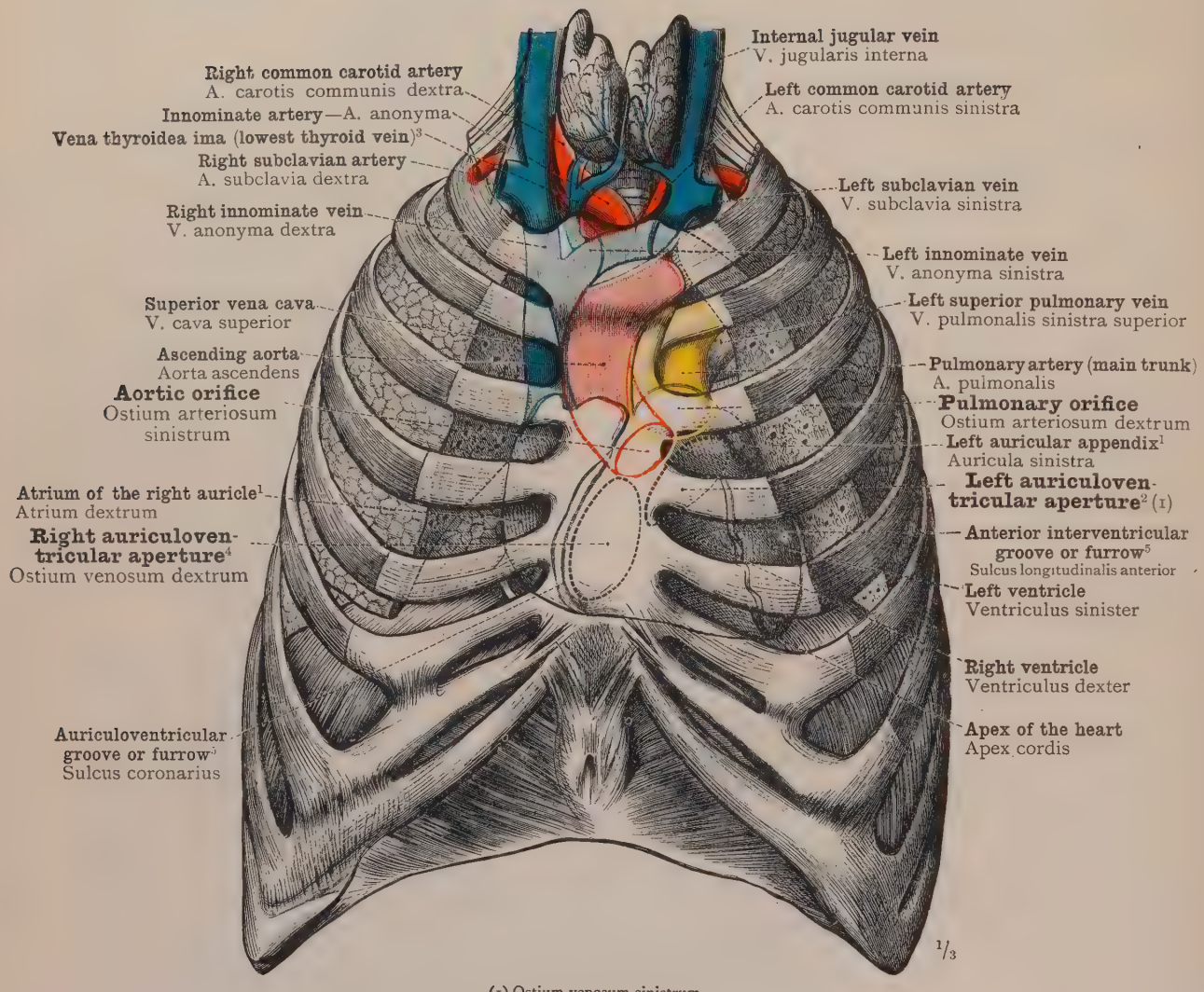
1 See Appendix, note 124.
2 See Appendix, note 125.
3 This represents the combined *upper* and *lower left azygos veins* of the normal body.—Tr.
4 See Appendix, note 111.
5 *Vena Obliqua Atrii Sinistri* (*Marshalli*). See Appendix, note 117.
6 Called by Macalister the *left marginal vein.*
7 Called by Macalister the *posterior interventricular vein.*
8 Called by Macalister the *anterior interventricular artery and vein.*
9 Or junction of the *parietal* and *visceral* pericardium. (See also note 2 to p. 565.)—Tr.

FIG. 975.—PERSISTENT LEFT SUPERIOR VENA CAVA (VENA CAVA SUPERIOR SINISTRA), AND ITS RELATIONS TO THE CARDIAC VEINS. SEEN FROM BEFORE, BELOW, AND THE LEFT SIDE.

The hemiazygos vein (*see note 3 above*) opens from behind into the left superior vena cava at the level of the body of the fourth dorsal vertebra. The comparatively slender transverse communicating branch between the right and the left superior vena cava, from which, after the obliteration of the proximal portion of the left superior vena cava, the transverse portion of the left innominate should in the natural course of development have been formed, receives, in addition to others, the inferior thyroid veins.

The thoracic cavity and the pericardium have been opened, and the heart has been drawn upwards and to the right, as in the preparation shown in Fig. 974. By the partial removal of the epicardium (visceral or cardiac pericardium), the left superior vena cava was laid bare in its course along the back of the left auricle and in the auriculo-ventricular groove, up to its termination in the sinus venosus of the right auricle; and its tributary veins and the branches of the coronary arteries were also dissected out.

Persistent Left Superior Vena Cava.



(1) Ostium venosum sinistrum

1 See Appendix, note 113.
2 Or *mitral orifice.*
3 Companion to the *thyroidea ima artery*—see note 1 to p. 590.—Tr.
4 Or *tricuspid orifice.*
5 See note 5 to p. 566.

FIG. 976.—POSITION OF THE HEART AND THE GREAT VESSELS AND OF THE CARDIAC ORIFICES, AND THE PROJECTION-OUTLINES OF THESE STRUCTURES ON THE ANTERIOR WALL OF THE THORAX.

After preliminary hardening with formalin, the pericardium was exposed in the intercostal spaces. The sternum was then sawn across horizontally at the level of the second and the sixth intercostal spaces, and was removed with a sufficient extent of the attached ribs and rib-cartilages to lay the heart fully bare. The excised portion of the wall of the thorax having been replaced in its position, the preparation was then photographed, first with, and then without, the excised segment, and the projection-outline of the heart was thus determined. By means of suitable incisions, the position and extent of the respective orifices was determined, as well as their projection-outlines upon the anterior surface of the heart. The cartilage of the eighth rib is in this specimen directly attached to the sternum; and the innominate and the left common carotid artery arise from the aorta by a common trunk.

Position and Projection-Outlines of the Heart, the Cardiac Orifices, and the Great Vessels.

ARTERIA PULMONALIS
THE PULMONARY ARTERY

ARTERIÆ TRUNCI
THE ARTERIES OF THE TRUNK

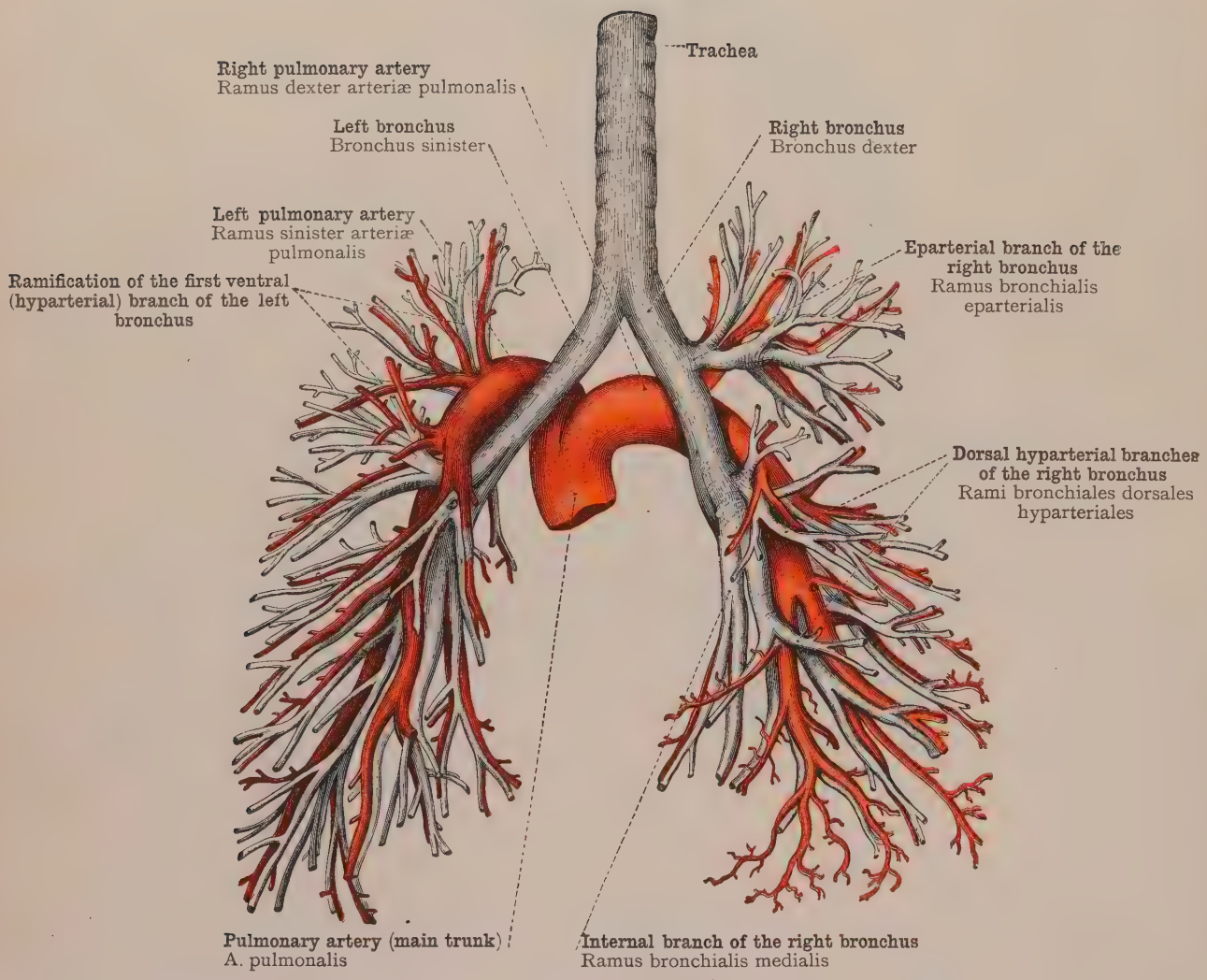


FIG. 977.—THE MAIN TRUNK OF THE PULMONARY ARTERY, ARTERIA PULMONALIS; ITS BIFURCATION INTO THE RIGHT AND THE LEFT PULMONARY ARTERY, RAMUS DEXTER ET RAMUS SINISTER ARTERIÆ PULMONALIS; THE RAMIFICATION OF THE PULMONARY ARTERIES WITHIN THE LUNG, AND THEIR RELATION TO THE BRONCHIAL RAMIFICATION. SEEN FROM BEHIND.

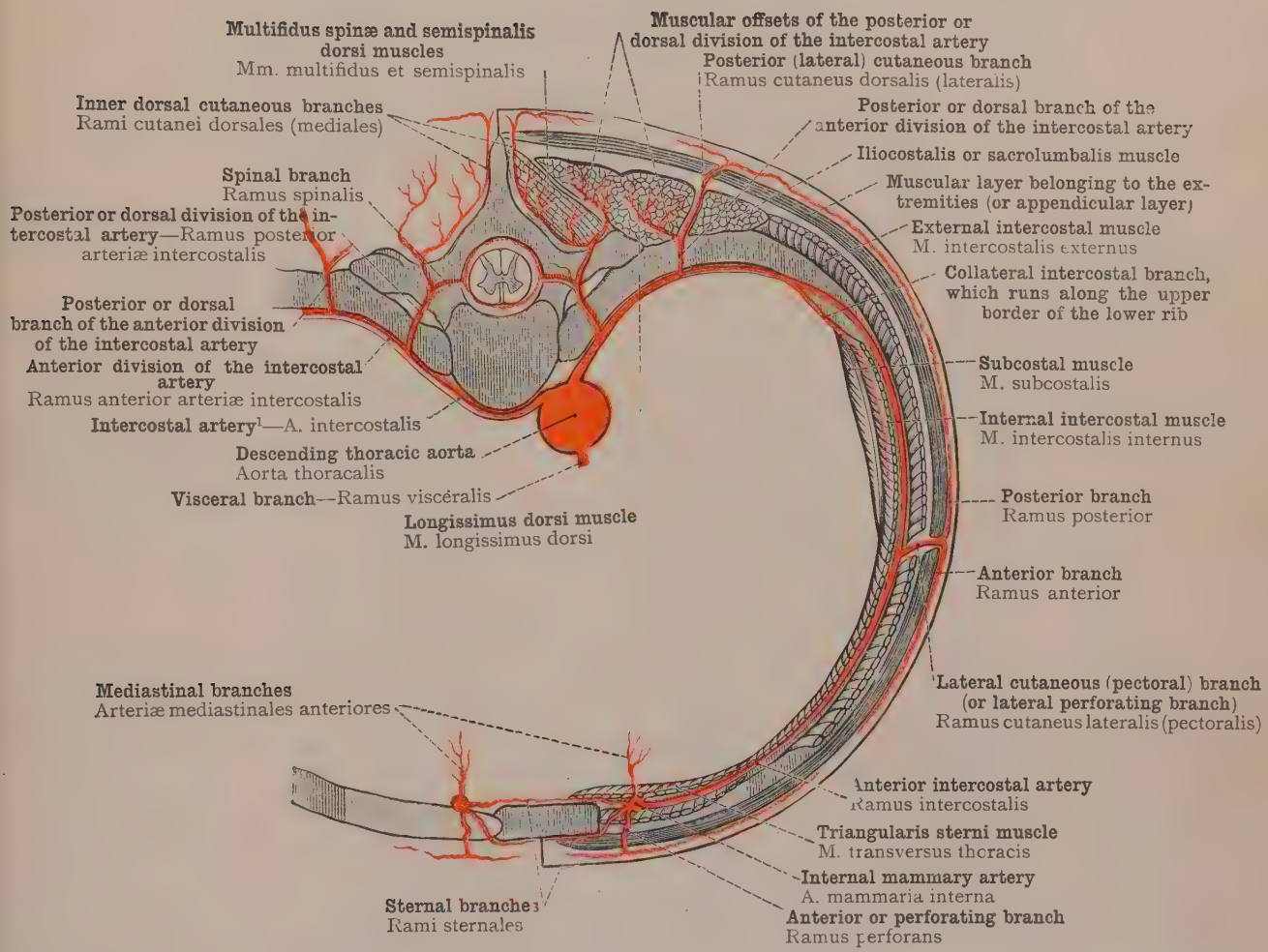
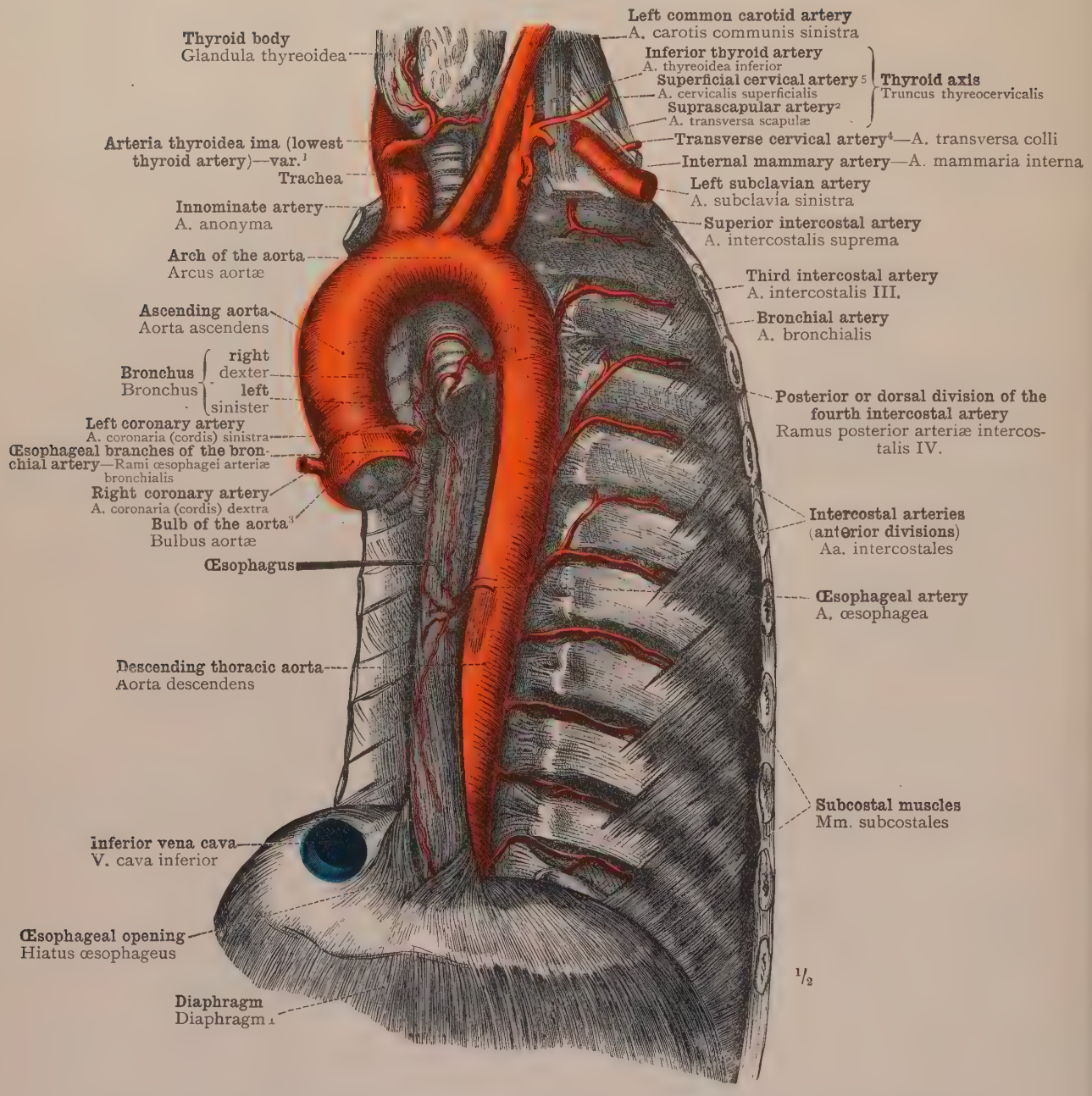

Multifidus spinæ and semispinalis dorsi muscles
Mm. multifidus et semispinalis
Muscular offsets of the posterior or dorsal division of the intercostal artery
Posterior (lateral) cutaneous branch
Ramus cutaneus dorsalis (lateralis)
Inner dorsal cutaneous branches
Rami cutanei dorsales (mediales)
Posterior or dorsal branch of the anterior division of the intercostal artery
Iliocostalis or sacrolumbalis muscle
Muscular layer belonging to the extremities (or appendicular layer)
Spinal branch
Ramus spinalis
Posterior or dorsal division of the intercostal artery—Ramus posterior arteriæ intercostalis
External intercostal muscle
M. intercostalis externus
Collateral intercostal branch, which runs along the upper border of the lower rib
Posterior or dorsal branch of the anterior division of the intercostal artery
Anterior division of the intercostal artery
Ramus anterior arteriæ intercostalis
Subcostal muscle
M. subcostalis
Intercostal artery[1]—A. intercostalis
Internal intercostal muscle
M. intercostalis internus
Descending thoracic aorta
Aorta thoracalis
Visceral branch—Ramus viscéralis
Posterior branch
Ramus posterior
Longissimus dorsi muscle
M. longissimus dorsi
Anterior branch
Ramus anterior
Lateral cutaneous (pectoral) branch (or lateral perforating branch)
Ramus cutaneus lateralis (pectoralis)
Mediastinal branches
Arteriæ mediastinales anteriores
Anterior intercostal artery
Ramus intercostalis
Triangularis sterni muscle
M. transversus thoracis
Internal mammary artery
A. mammaria interna
Sternal branches
Rami sternales
Anterior or perforating branch
Ramus perforans

FIG. 978.—DIAGRAMMATIC REPRESENTATION OF THE DISTRIBUTION OF THE ARTERIES SUPPLYING THE BODY-WALL, SHOWN IN A THORACIC SEGMENT.[1]

1 *Intercostal Arteries.*—Quain's description of the distribution of these arteries differs somewhat from that given in the text. The main trunk of the *intercostal artery* runs along the lower border of the upper rib, and ends by anatomosing with one of the anterior intercostal branches of the internal mammary artery. Its branches are (1) *posterior* or *dorsal* (*ramus posterior*), which gives *spinal*, *muscular* and *cutaneous* offsets (*ramus spinalis*, *rami musculares*, *rami cutanei dorsales mediales*), (2) the *collateral intercostal* branch, which runs along the upper border of the lower rib, and ends by anastomosing with the lower of the two anterior intercostal arteries given to each space by the internal mammary artery. The *ramus dorsalis* of the anterior division is not described by Quain; the *ramus cutaneus lateralis* (*pectoralis*), which accompanies the lateral cutaneous branch of the intercostal nerve, is named by that author only in the section on the "Morphology of the Arterial System," where it is shown to belong to the series of *lateral perforating arteries*.—TR.

Diagram of the Arteries of the Body-Wall.



1 *Arteria Thyroidea Ima* (*Lowest Thyroid Artery*).—This artery is met with on an average in one body in every ten. It may arise from the innominate trunk (most frequently), from the right common carotid, or from the aorta. In exceptional instances it springs from the internal mammary or from the subclavian artery. Its size is a very variable one, being related inversely to that of the other thyroid arteries. Lying in front of the trachea, this vessel, like the inferior thyroid veins, is endangered in the operation of tracheotomy.—Tr.

2 Known also as the *transverse scapular* or *transverse humeral artery*.

3 See note 1 to p. 569.

4 Or *posterior scapular artery* (Macalister). See Appendix, notes 134, 135, 172.

5 See Appendix, notes 134, 135, 172, 208.

Fig. 979.—Aorta Thoracalis, the Thoracic Aorta (consisting of the Ascending Aorta, the Arch of the Aorta, and the Descending Thoracic Aorta), with its Visceral and Parietal Branches seen from the Left Side and Before. Bronchial Arteries, Arteriæ Bronchiales. Œsophageal Arteries, Arteriæ Œsophageæ. Intercostal Arteries, Arteriæ Intercostales, in all the Left Intercostal Spaces except the Uppermost, are exposed as far forwards as the Internal Intercostal and Subcostal Muscles. Their division into Anterior and Posterior Branches (Rami Anteriores et Posteriores) is seen, and the Origin of the Muscular Branches (Rami Musculares) of the former.

The specimen shows a frequent variety in the origin of the fourth and fifth and of the sixth and seventh intercostal arteries from common roots. The second intercostal artery consists of the distal portion of the superior intercostal artery (arteria intercostalis suprema), which arises from the costocervical axis (truncus costocervicalis—*see Appendix, note* 177). From the subclavian artery arises the abnormal lowest thyroid artery of Neubauer, arteria thyroidea ima (*see note* 1 *above*).

Aorta thoracalis, the thoracic aorta.—Aa. bronchiales et œsophageæ, the bronchial and œsophageal arteries.—Aa. intercostales, the intercostal arteries.

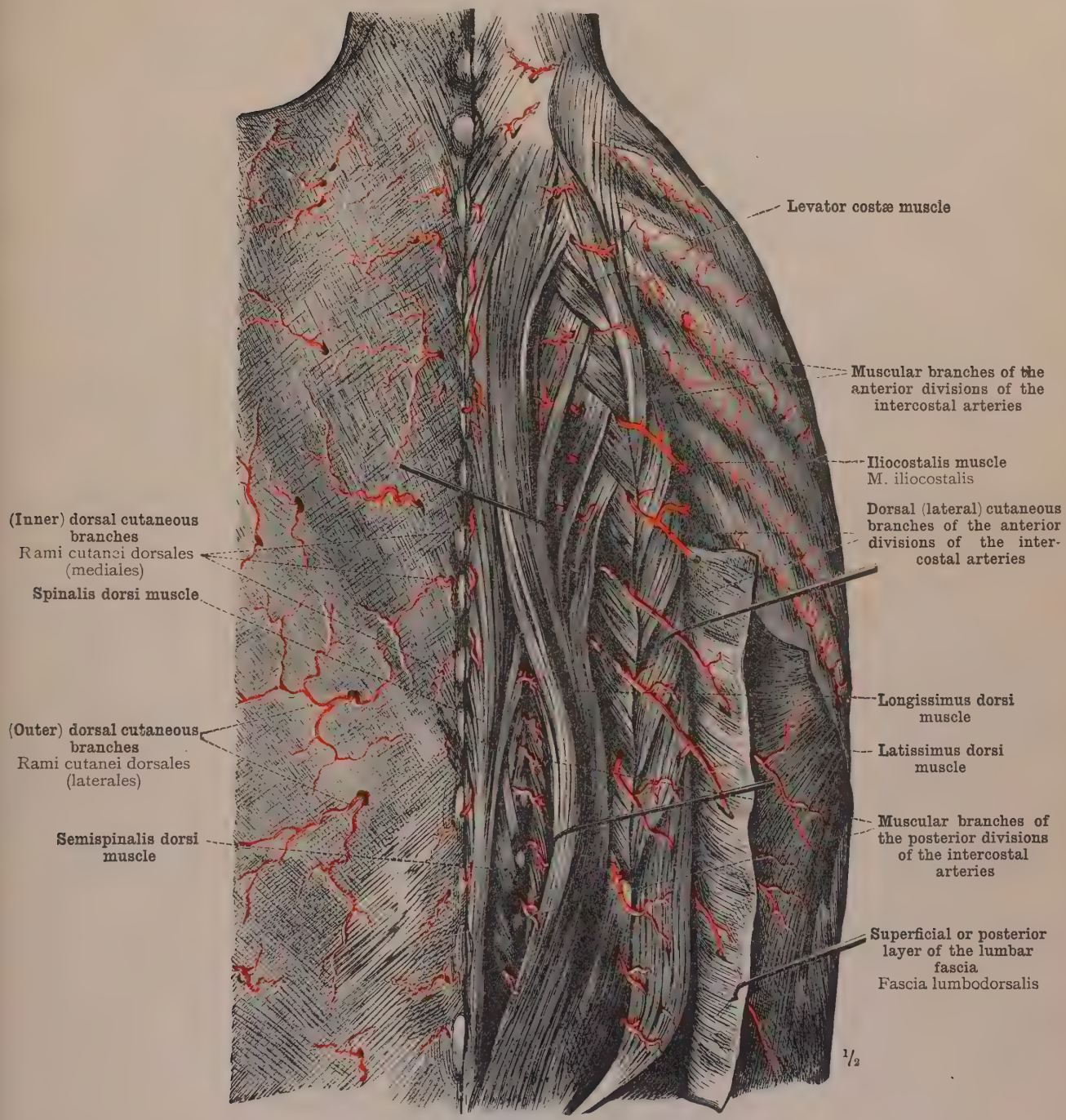

Levator costæ muscle
Muscular branches of the anterior divisions of the intercostal arteries
Iliocostalis muscle
M. iliocostalis
Dorsal (lateral) cutaneous branches of the anterior divisions of the intercostal arteries
(Inner) dorsal cutaneous branches
Rami cutanei dorsales (mediales)
Spinalis dorsi muscle
Longissimus dorsi muscle
(Outer) dorsal cutaneous branches
Rami cutanei dorsales (laterales)
Latissimus dorsi muscle
Muscular branches of the posterior divisions of the intercostal arteries
Semispinalis dorsi muscle
Superficial or posterior layer of the lumbar fascia
Fascia lumbodorsalis
½

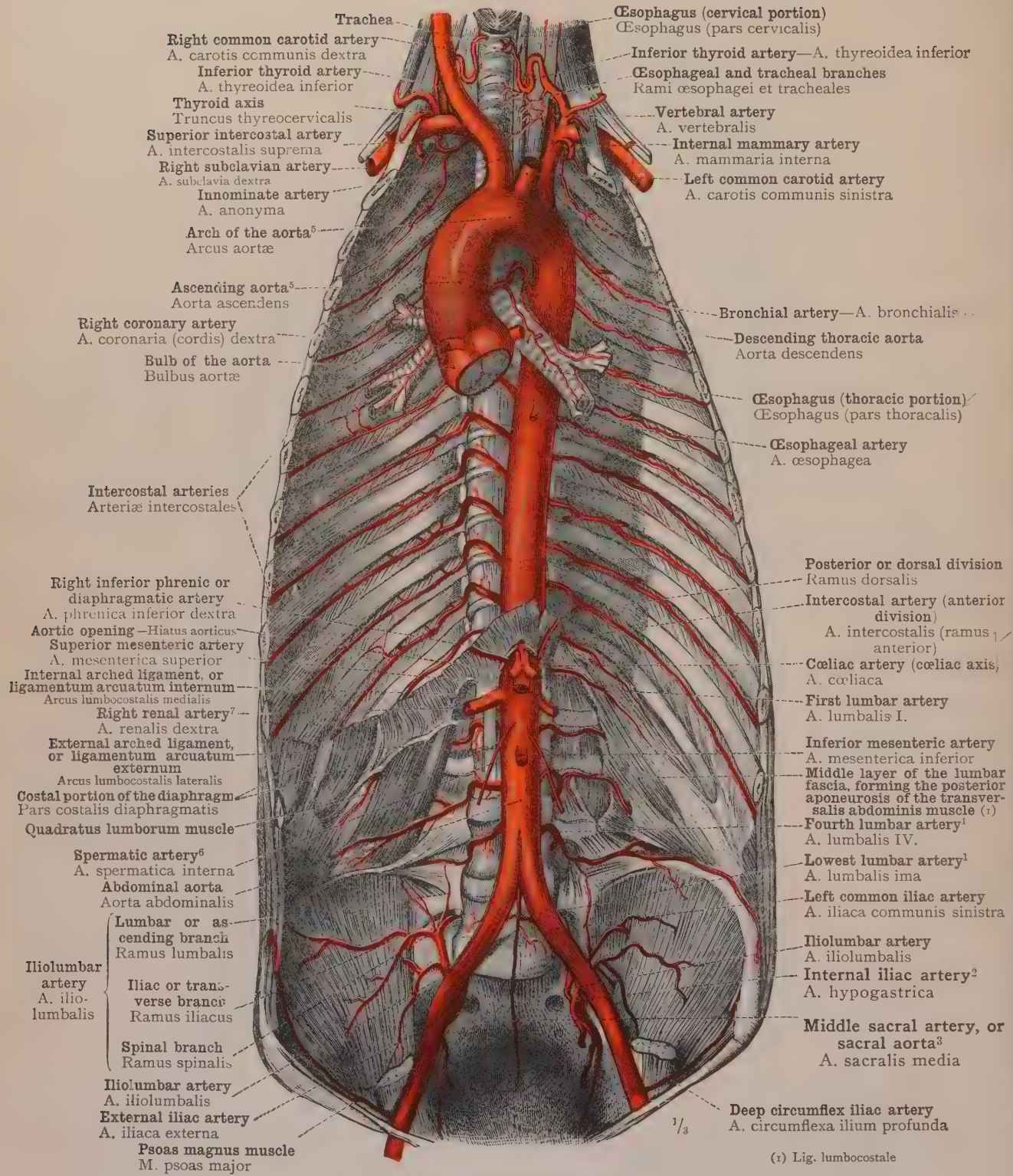
FIG. 980.—RAMIFICATION OF THE POSTERIOR OR DORSAL BRANCHES OF THE INTERCOSTAL ARTERIES IN THE BACK.

On the left side we see the inner and outer cutaneous branches; on the right side, chiefly the muscular branches. On the right side the superficial or posterior layer of the lumbar fascia (by some anatomists termed "the aponeurosis of the latissimus dorsi muscle"—*see Part III., Fig.* 507, *p.* 266, *Fig.* 508, *p.* 267, *and note* ¹ *to the latter page*) has been detached from the spinous processes and turned outwards; the iliocostalis muscle has been drawn outwards; and the longissimus dorsi muscle has been drawn outwards below, inwards above.

RAMI MUSCULARES ET RAMI CUTANEI DORSALES, MEDIALES ET LATERALES; THE INNER AND OUTER MUSCULAR AND CUTANEOUS POSTERIOR OR DORSAL BRANCHES OF THE INTERCOSTAL ARTERIES.

The outer row of branches is derived from the posterior or dorsal branches of the anterior divisions of the intercostal arteries, which divide between the longissimus dorsi and the iliocostalis muscles into inner and outer twigs.

Rami Posteriores, Posterior or Dorsal Branches, of the Intercostal Arteries.

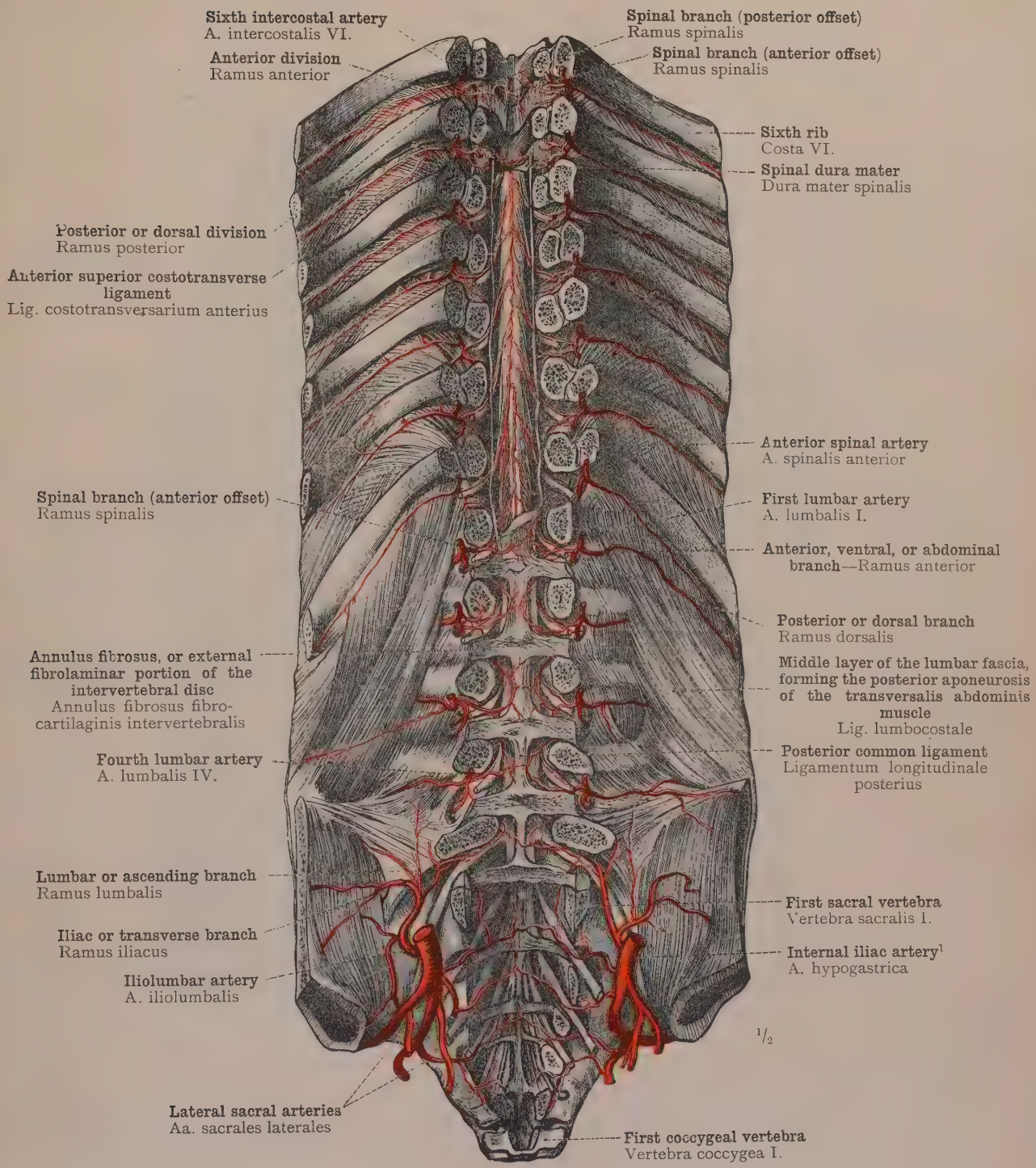


1 See Appendix, note 126. 2 See Appendix, note 120. 3 See Appendix, note 127. 4 See note 1 to p. 569.
5 See Appendix, note 128. 6 See Appendix, note 129. 7 See note 3 to p. 595.

FIG. 981.—PARIETAL BRANCHES OF THE THORACIC AND ABDOMINAL AORTA: THE INTERCOSTAL ARTERIES, THE LUMBAR ARTERIES, AND THE MIDDLE SACRAL ARTERY, OR SACRAL AORTA.

The visceral branches of the aorta, with the exception of the bronchial artery, have been cut away close to their origin.

Arteriæ intercostales et lumbales—The intercostal and lumbar arteries.

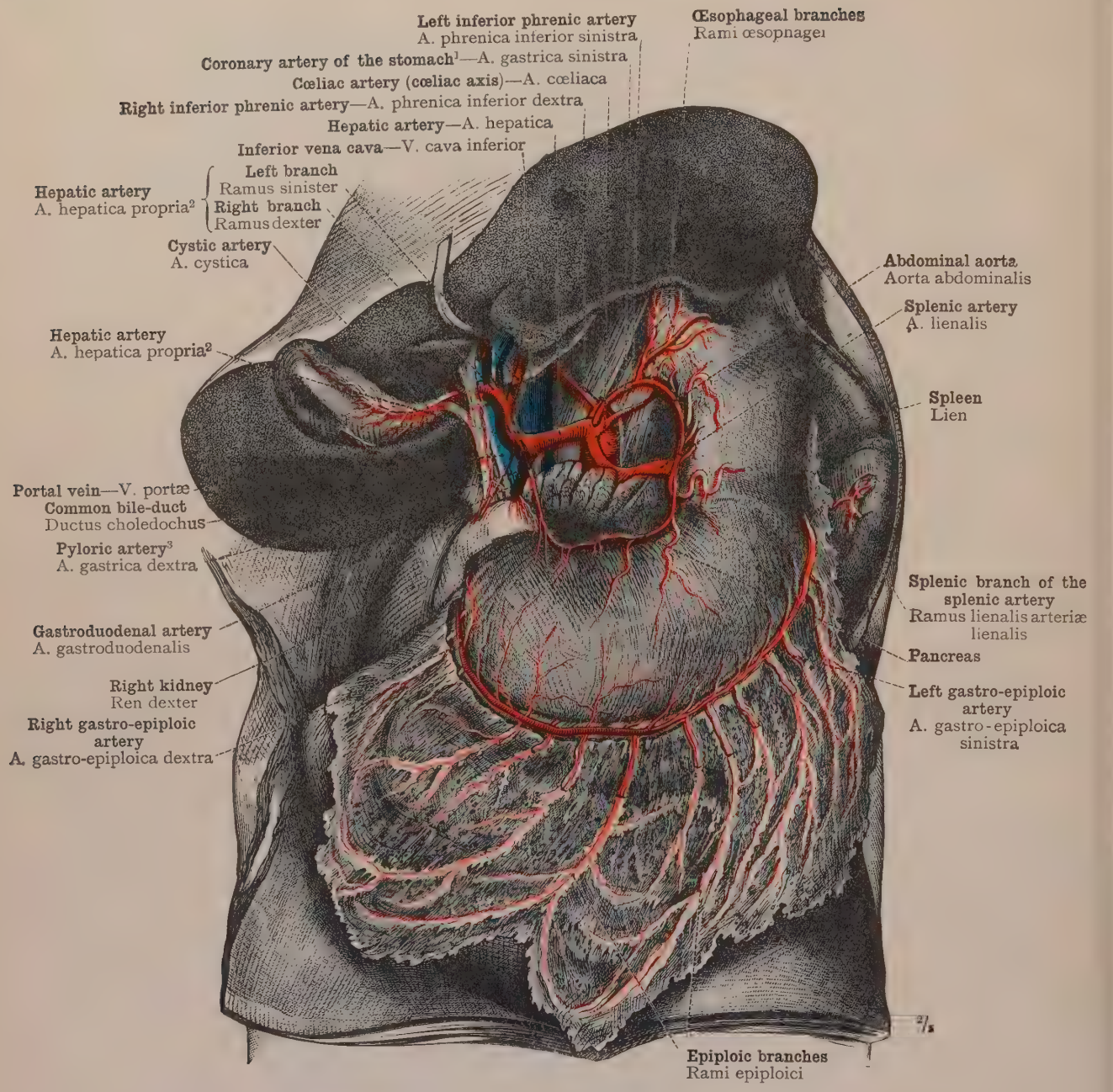


[1] See Appendix, note [120].

FIG. 982.—RAMI SPINALES, THE SPINAL BRANCHES, OF THE INTERCOSTAL, LUMBAR, AND LATERAL SACRAL ARTERIES (ARTERIÆ INTERCOSTALES, LUMBALES, ET SACRALES LATERALES), SEEN FROM BEFORE.

The spinal canal and the intervertebral foramina have been opened by the removal of the vertebral bodies or centra. Down to the eighth dorsal vertebra, the spinal cord and the dura mater have been removed; from the eighth dorsal to the first lumbar vertebra, the spinal cord has been laid bare by the removal of the dura mater; below the first lumbar vertebra the posterior common ligament and the hindmost portions of the intervertebral discs have been left intact.

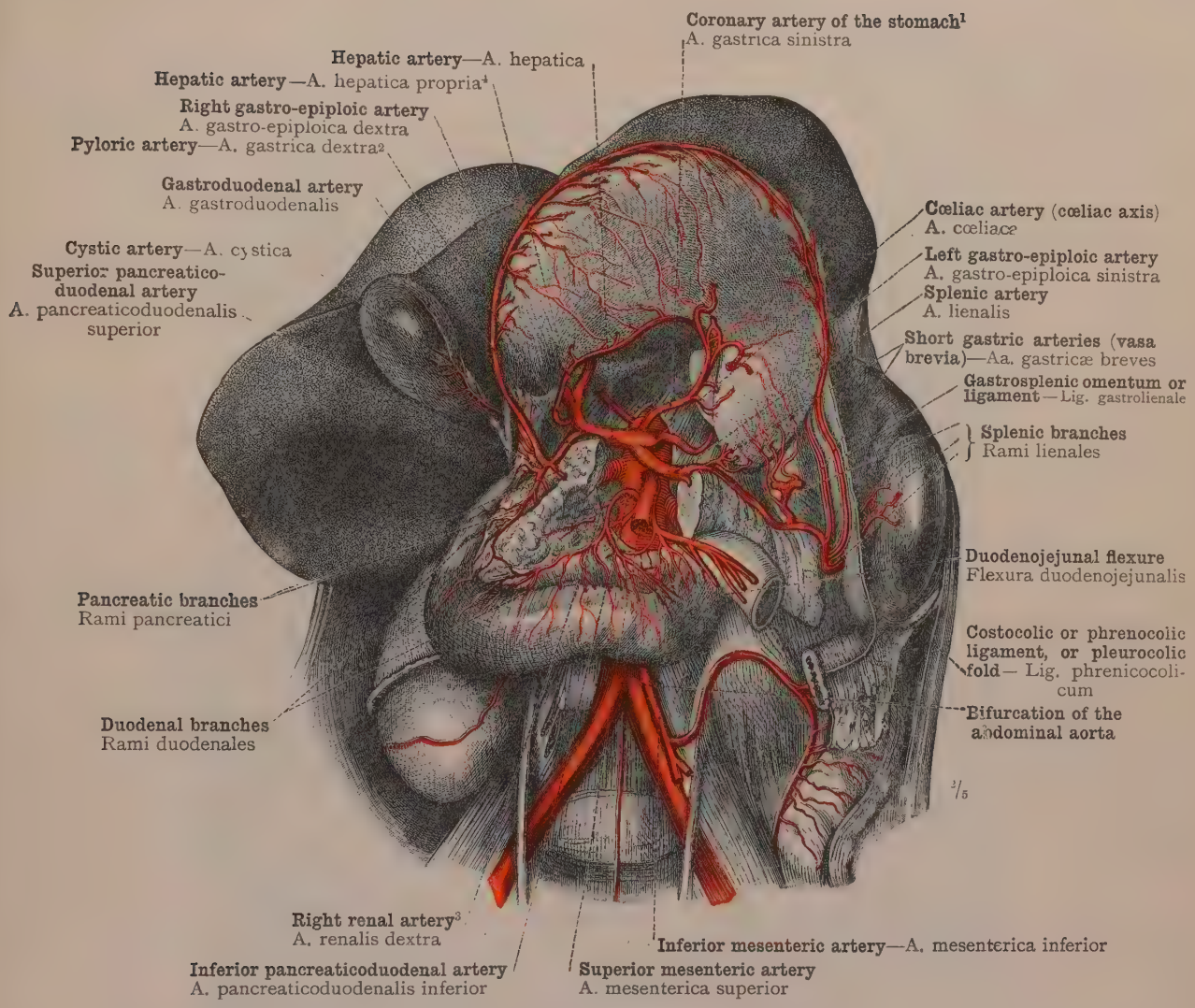
The Arteries of the Spinal Canal.



[1] Called by Macalister the *gastric artery.* [2] See Appendix, note [130]. [3] See Appendix, note [131].

FIG. 903.—THE DIVISION INTO THREE BRANCHES OF THE CŒLIAC ARTERY OR CŒLIAC AXIS (ARTERIA CŒLIACA, TRIPUS CŒLIACUS HALLERI) DISPLAYED FROM BEFORE BY THE REMOVAL OF THE SMALL OR GASTROHEPATIC OMENTUM. THESE BRANCHES ARE: THE CORONARY ARTERY OF THE STOMACH (ARTERIA GASTRICA SINISTRA —GASTRIC ARTERY, ACCORDING TO MACALISTER); THE SPLENIC ARTERY (ARTERIA SPLENICA); AND THE HEPATIC ARTERY (ARTERIA HEPATICA), WHICH DIVIDES INTO THE GASTRODUODENAL ARTERY AND THE *ARTERIA HEPATICA PROPRIA, THE LATTER GIVING OFF THE PYLORIC ARTERY (ARTERIA GASTRICA DEXTRA —SUPERIOR PYLORIC ARTERY, ACCORDING TO MACALISTER), AND THEN DIVIDING INTO LEFT AND RIGHT HEPATIC ARTERIES (*see Appendix, note* [130]). THE CYSTIC ARTERY IS DERIVED FROM THE RIGHT HEPATIC ARTERY; THE RIGHT GASTRO-EPIPLOIC ARTERY FROM THE GASTRODUODENAL ARTERY; AND THE LEFT GASTRO-EPIPLOIC ARTERY FROM THE SPLENIC ARTERY. IN THE GREAT OMENTUM, WHICH IS SPREAD OUT FLAT, ARE SEEN THE EPIPLOIC BRANCHES OF THE GASTRO-EPIPLOIC ARTERIES. IN THE *HEPATODUODENAL LIGAMENT (*part of the small or gastrohepatic omentum—see Appendix to Part IV., note* [42]) WE OBSERVE THE MUTUAL RELATIONS OF THE HEPATIC ARTERY, THE PORTAL VEIN, AND THE COMMON BILE-DUCT. THE LEFT INFERIOR PHRENIC ARTERY IS IN THIS SPECIMEN DERIVED FROM THE CŒLIAC AXIS (A COMMON VARIETY).

The Asymmetrical Visceral Branches of the Abdominal Aorta.

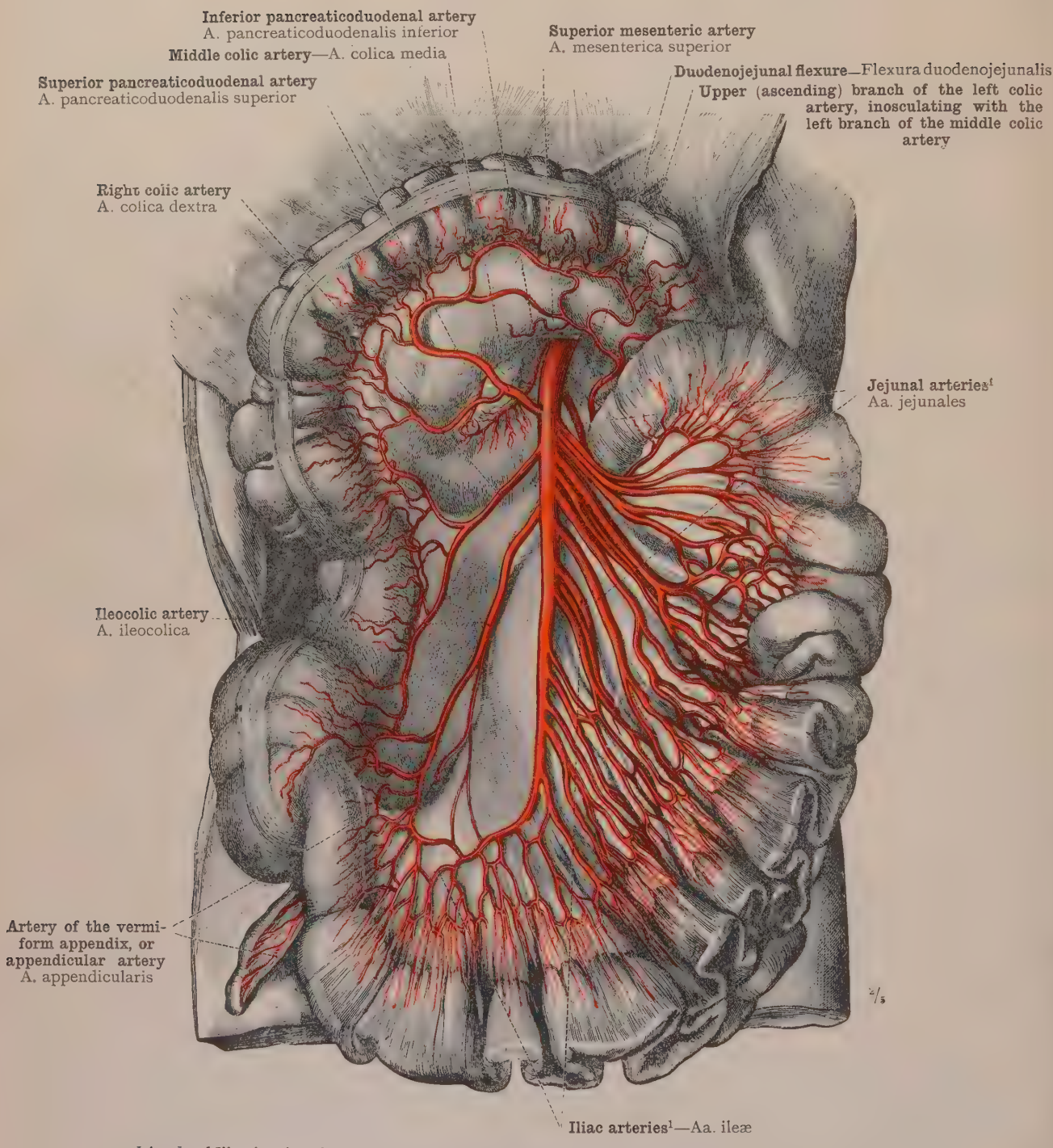


[1] Called by Macalister the *gastric artery*.
[2] Called by Macalister the *superior pyloric artery*—see Appendix, note [131].
[3] The *renal arteries* are sometimes known as the *emulgent arteries*, but the term is now rarely used. The name is derived from the function of the organs they supply (*emulgeo*, I milk or drain out).—Tr.
[4] See Appendix, note [130].

FIG. 984.—THE DISTRIBUTION OF THE BRANCHES OF THE CŒLIAC ARTERY OR CŒLIAC AXIS (ARTERIA CŒLIACA, TRIPUS CŒLIACUS HALLERI), SEEN FROM BEFORE: THE SPLENIC ARTERY, ARTERIA LIENALIS; ITS OFFSETS TO THE PANCREAS AND THE SPLEEN, RAMI PANCREATICI ET LIENALES; THE SHORT GASTRIC ARTERIES (VASA BREVIA), ARTERIÆ GASTRICÆ BREVES; THE LEFT GASTRO-EPIPLOIC ARTERY, ARTERIA GASTRO-EPIPLOICA SINISTRA, AND ITS ANASTOMOSIS WITH THE RIGHT GASTRO-EPIPLOIC ARTERY, ARTERIA GASTRO-EPIPLOICA DEXTRA; THE BIFURCATION OF THE GASTRODUODENAL ARTERY, ARTERIA GASTRODUODENALIS; THE PANCREATIC AND DUODENAL OFFSETS, RAMI PANCREATICI ET DUODENALES, OF THE SUPERIOR AND INFERIOR PANCREATICODUODENAL ARTERIES, ARTERIÆ PANCREATICODUODENALES, SUPERIOR ET INFERIOR.

In the preparation shown in Fig. 983, the liver was drawn upwards as far as possible, and the stomach also turned up. The duodenum and the pancreas were laid bare. By the removal of a portion of the body of the pancreas, the abdominal aorta with the origin of the two renal arteries and the superior mesenteric artery was exposed. The great or gastrocolic omentum was removed, except the gastrosplenic omentum or ligament, which was left intact.

The Asymmetrical Visceral Branches of the Abdominal Aorta.

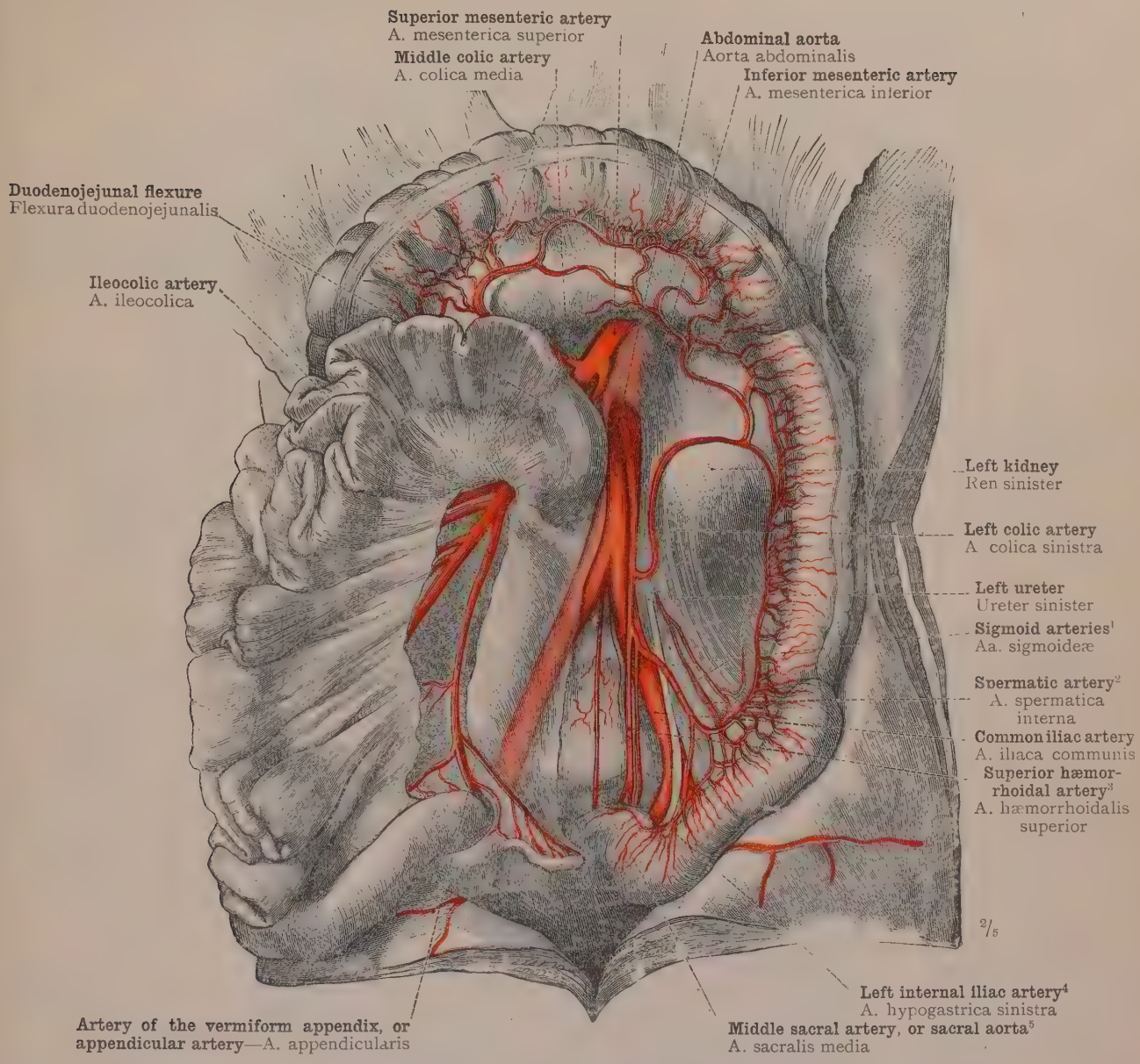


[1] *Jejunal and Iliac Arteries.*—Quain calls these indifferently the *intestinal branches* of the superior mesenteric artery; but Macalister, like Toldt, classifies the upper half as *jejunal*, and the lower half as *iliac arteries*.—Tr.

FIG. 985.—THE DISTRIBUTION OF THE SUPERIOR MESENTERIC ARTERY, ARTERIA MESENTERICA SUPERIOR. THE INTESTINAL ARTERIES, ARTERIÆ INTESTINALES: SUPERIOR PANCREATICODUODENAL ARTERY, ARTERIA PANCREATICODUODENALIS SUPERIOR; JEJUNAL AND ILIAC ARTERIES, ARTERIÆ JEJUNALES ET ILIACÆ; ILEOCOLIC ARTERY, ARTERIA ILEOCOLICA, GIVING OFF THE ARTERY OF THE VERMIFORM APPENDIX OR APPENDICULAR ARTERY, ARTERIA APPENDICULARIS; THE RIGHT COLIC ARTERY, ARTERIA COLICA DEXTRA; THE MIDDLE COLIC ARTERY, ARTERIA COLICA MEDIA.

The jejunum and ileum with their mesentery have been drawn to the left side; the colon and the transverse mesocolon have been drawn upwards.

The Asymmetrical Visceral Branches of the Abdominal Aorta.

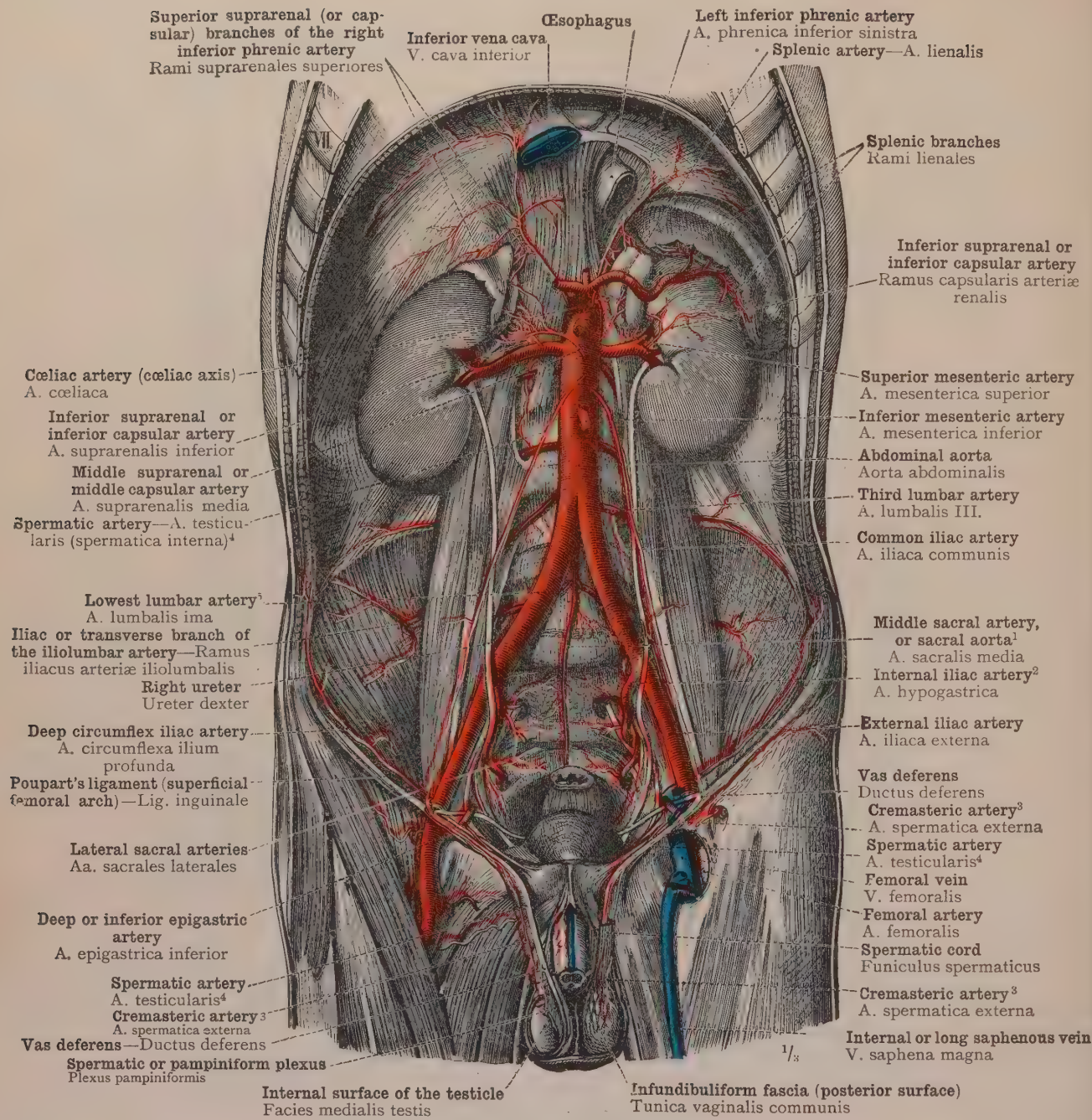


[1] *Sigmoid Artery.*—This branch of the inferior mesenteric artery is described as normally single. Two *sigmoid arteries*, as in the specimen figured above, are, however, of quite frequent occurrence; and in some instances as many as three may be met with.—Tr.
[2] See Appendix, note [129].
[3] Called by Macalister the *superior rectal artery.*
[4] See Appendix, note [120].
[5] See Appendix, note [127].

FIG. 986.—THE DISTRIBUTION OF THE INFERIOR MESENTERIC ARTERY, ARTERIA MESENTERICA INFERIOR: THE LEFT COLIC ARTERY, ARTERIA COLICA SINISTRA, AND ITS INOSCULATION WITH THE MIDDLE COLIC ARTERY, ARTERIA COLICA MEDIA; THE SIGMOID ARTERIES, ARTERIÆ SIGMOIDEÆ, AND THE SUPERIOR HÆMORRHOIDAL (OR SUPERIOR RECTAL) ARTERY, ARTERIA HÆMORRHOIDALIS SUPERIOR. THE ILEOCOLIC ARTERY, ARTERIA ILEOCOLICA, DERIVED FROM THE SUPERIOR MESENTERIC ARTERY, ARTERIA MESENTERICA SUPERIOR, AND SUPPLYING THE ARTERY OF THE VERMIFORM APPENDIX OR APPENDICULAR ARTERY, ARTERIA APPENDICULARIS.

In the preparation shown in Fig. 985, the colon and the transverse mesocolon were drawn upwards; the jejunum and ileum with their mesentery to the left. By cutting through the left peritoneal layer of the mesentery of the small intestine, the ileocolic artery was exposed, and its offset to the vermiform appendix (appendicular artery) was traced to its destination.

The Asymmetrical Visceral Branches of the Abdominal Aorta.



[1] See Appendix, note [127]. [2] See Appendix, note [120]. [3] See Appendix, note [129].

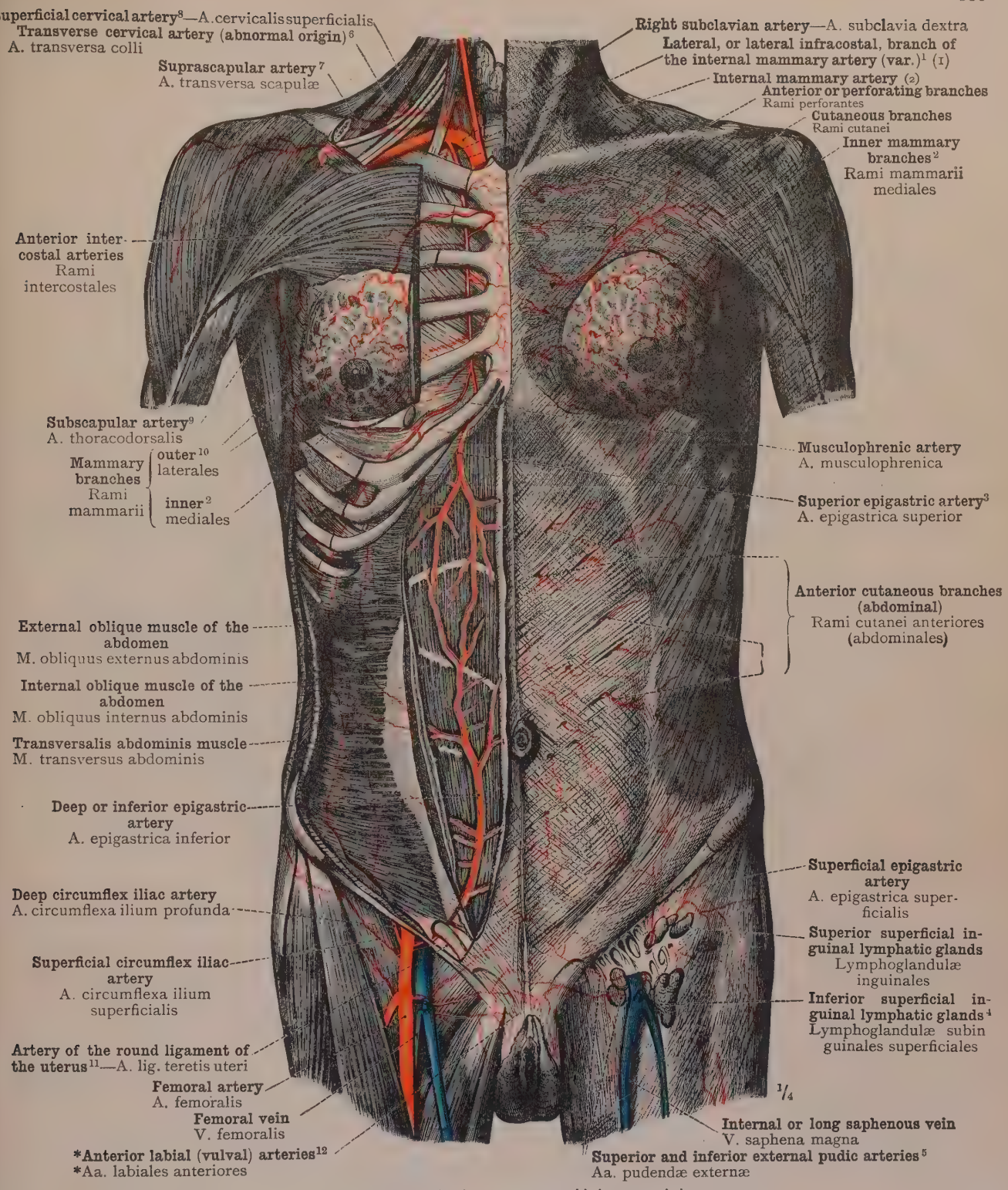
[4] *Arteria Testicularis.*—This name is used by the author as a synonym for *arteria spermatica interna*, the spermatic artery of English anatomists. (See Appendix, note [129].)—Tr.

[5] See Appendix, note [126].

FIG. 987.—THE PARIETAL BRANCHES AND THE SYMMETRICAL (PAIRED) VISCERAL BRANCHES OF THE ABDOMINAL AORTA: THE INFERIOR PHRENIC OR INFERIOR DIAPHRAGMATIC ARTERIES AND THE LUMBAR ARTERIES; THE MIDDLE SACRAL ARTERY, OR SACRAL AORTA, AND THE LATERAL SACRAL ARTERIES; THE SPLENIC ARTERIES, THE RENAL OR EMULGENT ARTERIES (*see note* [3] *to p.* 595), AND THE SUPRARENAL OR CAPSULAR ARTERIES; THE SPERMATIC ARTERIES (ARTERIÆ TESTICULARES ET ARTERIÆ SPERMATICÆ INTERNÆ), AND THE CREMASTERIC ARTERIES (ARTERIÆ SPERMATICÆ EXTERNÆ) *see Appendix, note* [129].

The abdominal viscera were removed, with the exception of the spleen, the kidneys, and the suprarenal capsules (adrenals). After removing the anterior half of the scrotum, the internal surface of the right testicle was laid bare by the removal of its coverings, in order to display the entrance of the spermatic artery into the gland; the left testicle was rotated inwards, in order to show the terminal ramification of the cremasteric artery on the infundibuliform fascia, and between the fasciculi of the cremaster muscle.

The Parietal Branches and the Symmetrical (Paired) Visceral Branches of the Abdominal Aorta.



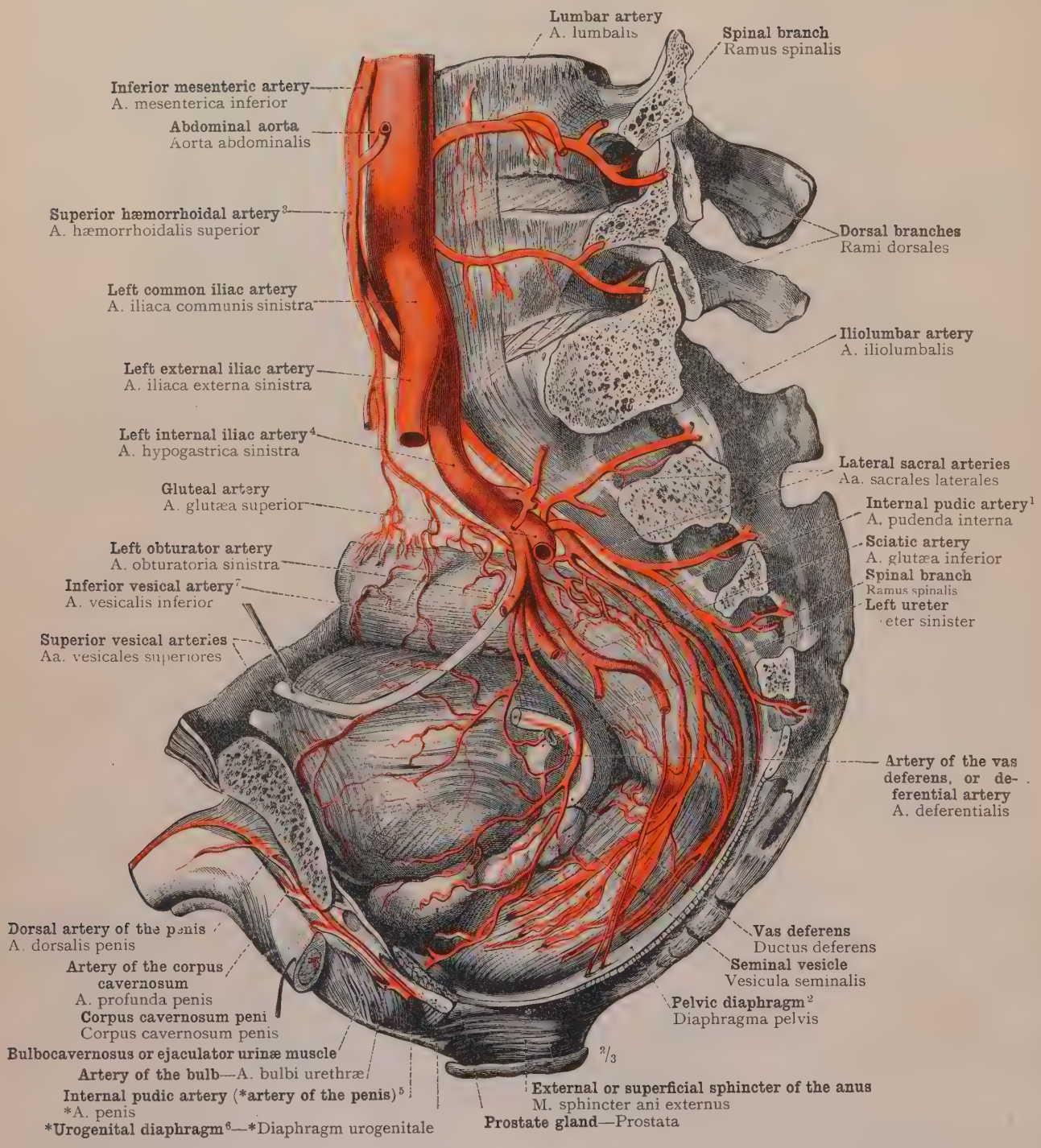
(1) Ramus costalis lateralis (var.)

(2) A. mammaria interna

1 See Appendix, note 132.
2 See Appendix, note 133.
3 Also called the *abdominal* branch of the internal mammary artery.
4 Often called the *femoral lymphatic glands.*
5 The upper of these is named by Macalister the *superior* or *superficial pubic*; the lower, the *inferior pubic artery.*—Tr.
6 See Appendix, note 134.
7 Called also the *transverse scapular* or *transverse humeral artery.*
8 See Appendix, note 135.
9 See Appendix, note 136.
10 See Appendix, note 137.
11 This branch of the inferior or deep epigastric artery is the homologue in the female of the *cremasteric artery* of the male.—Tr.
12 See Appendix, note 138.

FIG. 988.—ON THE LEFT SIDE OF THE BODY THE SUPERFICIAL ARTERIES ARE SHOWN; ON THE RIGHT SIDE IN THE INTERCOSTAL SPACES THE INTERNAL MAMMARY ARTERY AND ITS MUSCULOPHRENIC BRANCH (ARTERIÆ MAMMARIA INTERNA ET MUSCULOPHRENICA) ARE EXPOSED, ALSO, BY PARTIAL REMOVAL OF THE RECTUS ABDOMINIS MUSCLE, THE SUPERIOR EPIGASTRIC ARTERY AND THE INFERIOR OR DEEP EPIGASTRIC ARTERY (ARTERIÆ EPIGASTRICÆ, SUPERIOR ET INFERIOR).

The Arteries of the Anterior Wall of the Trunk.

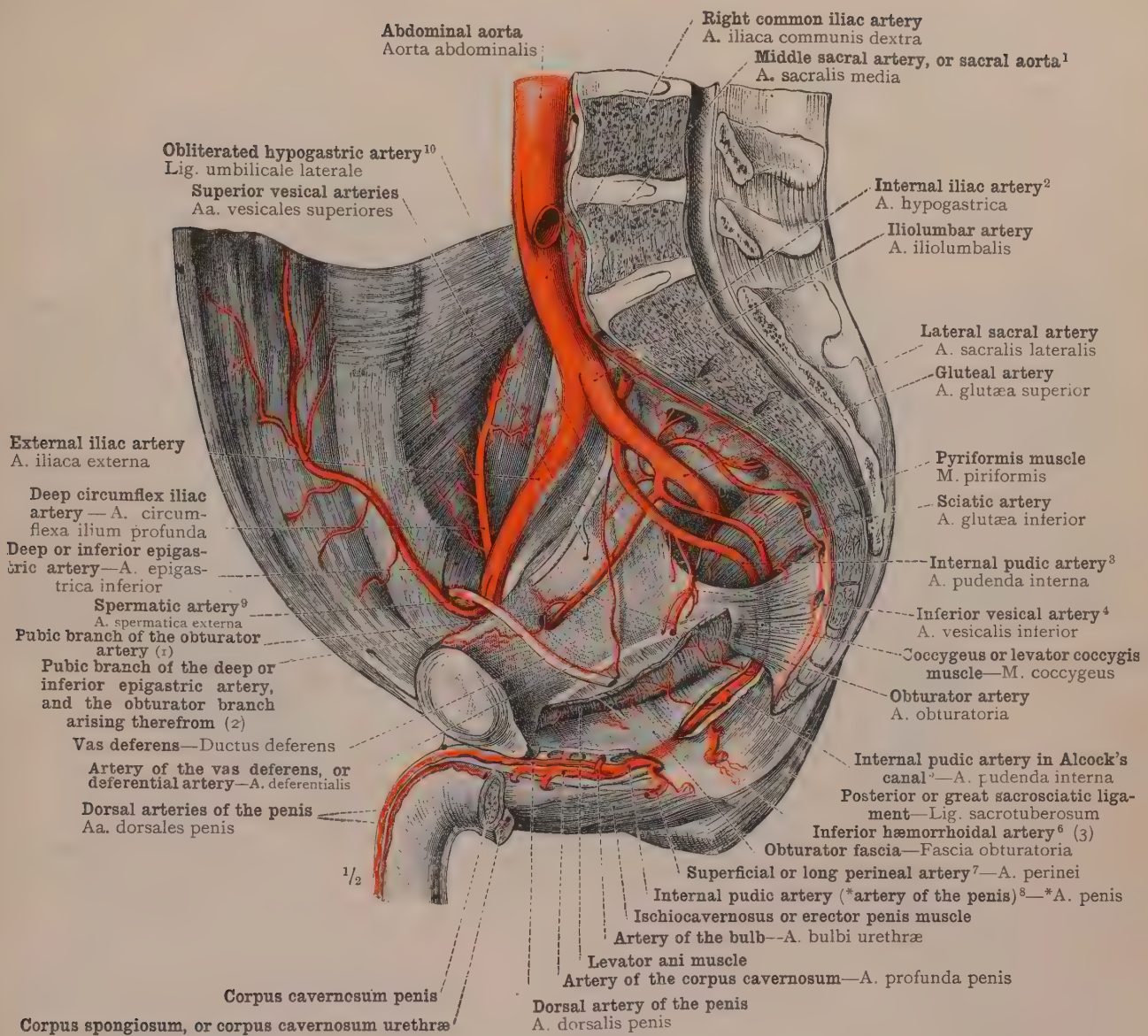


[1] See Appendix, note [139]. [2] See Appendix, note [140]. [3] Called by Macalister the *superior rectal artery*.
[4] See Appendix, note [120]. [5] See Appendix, note [141]. [6] See Appendix, note [142]. [7] See Appendix, note [143].

FIG. 989.—THE VISCERAL BRANCHES, RAMI VISCERALES, OF THE INTERNAL ILIAC ARTERY, ARTERIA HYPOGASTRICA (*see Appendix, note* [120]), AS SEEN ON THE LEFT SIDE OF THE MALE PELVIS.

The left innominate bone was sawn through close to the pubic symphysis, and was removed together with the left part of the sacrum; a small part of the left side of the pelvic diaphragm (*see Appendix, note* [140]) was preserved, and was drawn down a little towards the perineum. Further, by the removal of the transverse processes of the fourth and fifth lumbar vertebræ, the dorsal branches of the two lowest lumbar arteries and the lateral sacral arteries were displayed, and their spinal branches (rami spinales) were traced to their entrance into the spinal canal.

The Arteries of the Male Pelvic Viscera.


Abdominal aorta
Aorta abdominalis
Right common iliac artery
A. iliaca communis dextra
Middle sacral artery, or sacral aorta[1]
A. sacralis media
Obliterated hypogastric artery[10]
Lig. umbilicale laterale
Superior vesical arteries
Aa. vesicales superiores
Internal iliac artery[2]
A. hypogastrica
Iliolumbar artery
A. iliolumbalis
Lateral sacral artery
A. sacralis lateralis
Gluteal artery
A. glutæa superior
External iliac artery
A. iliaca externa
Pyriformis muscle
M. piriformis
Deep circumflex iliac artery—A. circumflexa ilium profunda
Sciatic artery
A. glutæa inferior
Deep or inferior epigastric artery—A. epigastrica inferior
Internal pudic artery[3]
A. pudenda interna
Spermatic artery[9]
A. spermatica externa
Inferior vesical artery[4]
A. vesicalis inferior
Pubic branch of the obturator artery (1)
Coccygeus or levator coccygis muscle—M. coccygeus
Pubic branch of the deep or inferior epigastric artery, and the obturator branch arising therefrom (2)
Obturator artery
A. obturatoria
Vas deferens—Ductus deferens
Internal pudic artery in Alcock's canal—A. pudenda interna
Artery of the vas deferens, or deferential artery—A. deferentialis
Posterior or great sacrosciatic ligament—Lig. sacrotuberosum
Dorsal arteries of the penis
Aa. dorsales penis
Inferior hæmorrhoidal artery[6] (3)
Obturator fascia—Fascia obturatoria
1/2
Superficial or long perineal artery[7]—A. perinei
Internal pudic artery (*artery of the penis)[8]—*A. penis
Ischiocavernosus or erector penis muscle
Artery of the bulb—A. bulbi urethræ
Levator ani muscle
Artery of the corpus cavernosum—A. profunda penis
Corpus cavernosum penis
Dorsal artery of the penis
A. dorsalis penis
Corpus spongiosum, or corpus cavernosum urethræ

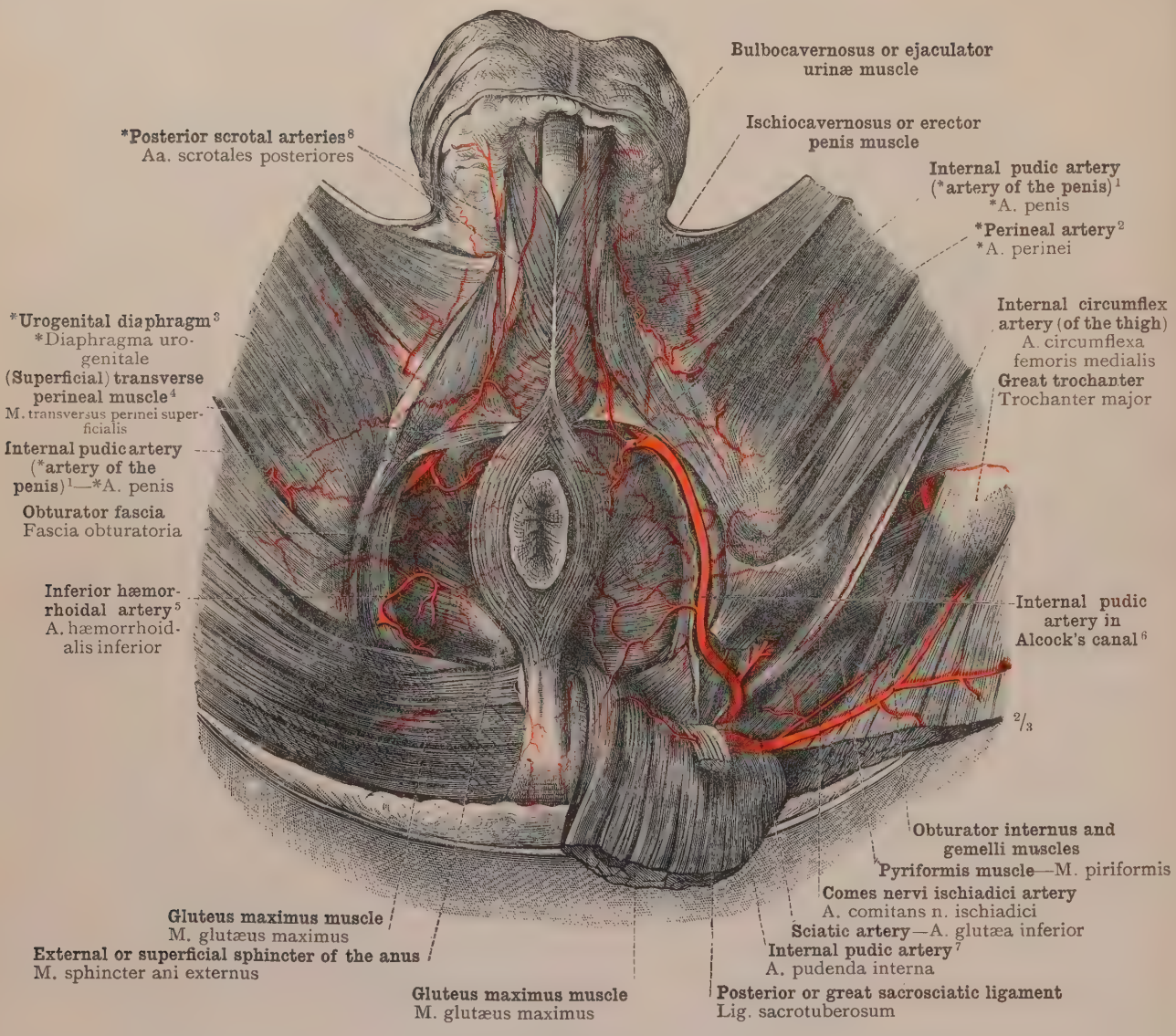
(1) Ramus pubicus arteriæ obturatoriæ (2) Ramus pubicus et ramus obturatorius arteriæ epigastricæ inferioris (3) A. hæmorrhoidalis inferior

1 See Appendix, note 12.
2 See Appendix, note 120.
3 See Appendix, note 139.
4 See Appendix, note 144.
5 See Appendix, note 145.
6 See Appendix, note 146.
7 See Appendix, note 147.
8 See Appendix, note 141.
9 See Appendix, note 129.
10 See Appendix, note 148.

FIG. 990.—THE PARIETAL BRANCHES, RAMI PARIETALES, OF THE INTERNAL ILIAC ARTERY, ARTERIA HYPOGASTRICA (*see Appendix, note* 120) : ARTERIA ILIOLUMBALIS, THE ILIOLUMBAR ARTERY; ARTERIA SACRALIS LATERALIS ET ARTERIA SACRALIS MEDIA, THE LATERAL SACRAL ARTERY AND THE MIDDLE SACRAL ARTERY (OR SACRAL AORTA—*see Appendix, note* 127) ; ARTERIA GLUTÆA SUPERIOR ET ARTERIA GLUTÆA INFERIOR, THE GLUTEAL ARTERY AND THE SCIATIC ARTERY ; ARTERIA OBTURATORIA, THE OBTURATOR ARTERY, AND THE ANASTOMOSIS OF ITS PUBIC BRANCH (RAMUS PUBICUS) WITH THE OBTURATOR BRANCH (RAMUS OBTURATORIUS) OF THE DEEP OR INFERIOR EPIGASTRIC ARTERY (ARTERIA EPIGASTRICA INFERIOR). ARTERIA CIRCUMFLEXA ILIUM PROFUNDA, THE DEEP CIRCUMFLEX ILIAC ARTERY ; ARTERIA EPIGASTRICA INFERIOR, THE DEEP OR INFERIOR EPIGASTRIC ARTERY, WITH THE SPERMATIC ARTERY (ARTERIA SPERMATICA EXTERNA—*see Appendix, note* 129) AND THE ARTERY OF THE VAS DEFERENS OR DEFERENTIAL ARTERY (ARTERIA DEFERENTIALIS). THE COURSE OF THE INTERNAL PUDIC ARTERY (ARTERIA PUDENDA INTERNA), AND THE ORIGIN OF THE BRANCHES TO THE EXTERNAL GENITAL ORGANS (*see Appendix, notes* 139, 141, 145 *and* 147).

In the preparation shown in Fig. 989, the pelvic viscera and the remains of the left half of the pelvis were removed; the levator ani muscle was turned upwards, and beneath this muscle the outer layer of the obturator fascia was removed to display the internal pudic artery in Alcock's canal (*see Appendix, note* 145). The bulb of the urethra and the left crus of the penis were removed, to show the entrance of the artery of the corpus cavernosum (arteria profunda penis) into the structure which it supplies, and the course of the dorsal artery of the penis (arteria dorsalis penis) on to the dorsum of the penis.

The Arteries of the Lateral Wall of the Pelvis and of the External Genital Organs.

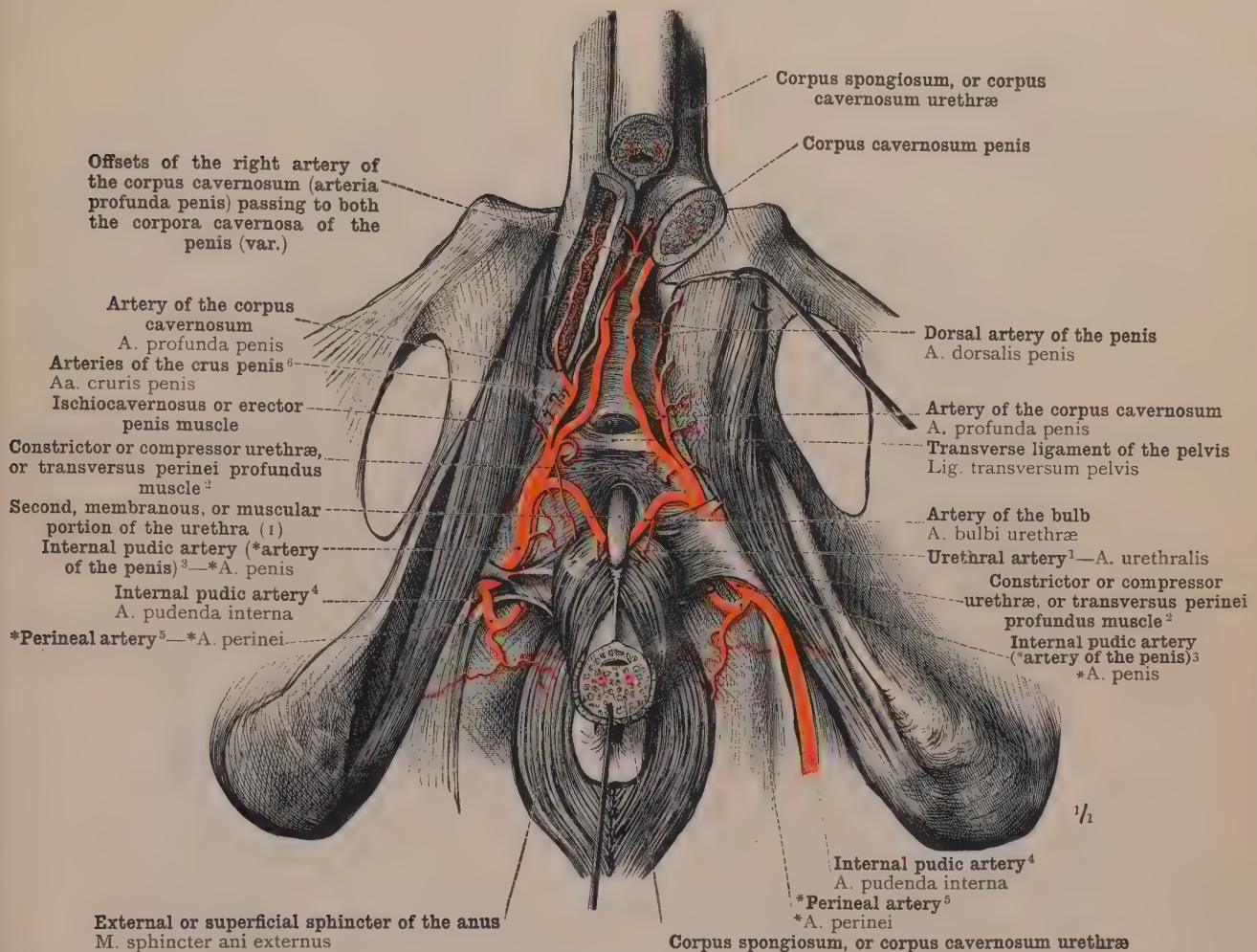


[1] See Appendix, note [141].
[2] See Appendix, note [149].
[3] See Appendix, note [142].
[4] See note [1] to p. 527 in Part IV.
[5] See Appendix, note [150].
[6] See Appendix, note [151].
[7] See Appendix, note [139].
[8] See Appendix, note [138].

FIG. 991.—THE COURSE AND DISTRIBUTION OF THE INTERNAL PUDIC ARTERY (ARTERIA PUDENDA INTERNA) IN THE MALE PERINEAL REGION: THE INFERIOR OR EXTERNAL HÆMORRHOIDAL ARTERY (ANAL ARTERY, ACCORDING TO MACALISTER), ARTERIA HÆMORRHOIDALIS INFERIOR, AND THE *PERINEAL ARTERY (*i.e.*, TRANSVERSE PERINEAL AND SUPERFICIAL OR LONG PERINEAL ARTERIES—*see Appendix, notes* [147] *and* [149]), ARTERIA PERINEI, WITH THE TERMINATION OF THE SUPERFICIAL OR LONG PERINEAL ARTERY BY ITS DIVISION INTO THE TWO POSTERIOR SCROTAL ARTERIES, ARTERIÆ SCROTALES POSTERIORES (*see Appendix, note* [138]).

On the left side of the body, the course of the internal pudic artery (arteria pudenda interna) is shown from its emergence from the pelvis through the great sacrosciatic foramen until it penetrates the base of the triangular ligament of the urethra (in the author's terminology, up to its entrance into the *urogenital diaphragm—*see Appendix, note* [142]); the gluteus maximus muscle has been partially divided by an incision passing upwards from its lower border and has been turned upwards, the great sacrosciatic ligament has been divided, Alcock's canal has been opened (*see Appendix, note* [151]), and the (superficial) transverse muscle of the perineum has been entirely removed.

The Arteries of the Male Perineal Region.


Corpus spongiosum, or corpus cavernosum urethræ
Corpus cavernosum penis
Offsets of the right artery of the corpus cavernosum (arteria profunda penis) passing to both the corpora cavernosa of the penis (var.)
Artery of the corpus cavernosum
A. profunda penis
Arteries of the crus penis [6]
Aa. cruris penis
Ischiocavernosus or erector penis muscle
Constrictor or compressor urethræ, or transversus perinei profundus muscle [2]
Second, membranous, or muscular portion of the urethra (1)
Internal pudic artery (*artery of the penis) [3]—*A. penis
Internal pudic artery [4]
A. pudenda interna
*Perineal artery [5]—*A. perinei
Dorsal artery of the penis
A. dorsalis penis
Artery of the corpus cavernosum
A. profunda penis
Transverse ligament of the pelvis
Lig. transversum pelvis
Artery of the bulb
A. bulbi urethræ
Urethral artery [1]—A. urethralis
Constrictor or compressor urethræ, or transversus perinei profundus muscle [2]
Internal pudic artery (*artery of the penis) [3]
*A. penis
1/1
Internal pudic artery [4]
A. pudenda interna
*Perineal artery [5]
*A. perinei
External or superficial sphincter of the anus
M. sphincter ani externus
Corpus spongiosum, or corpus cavernosum urethræ

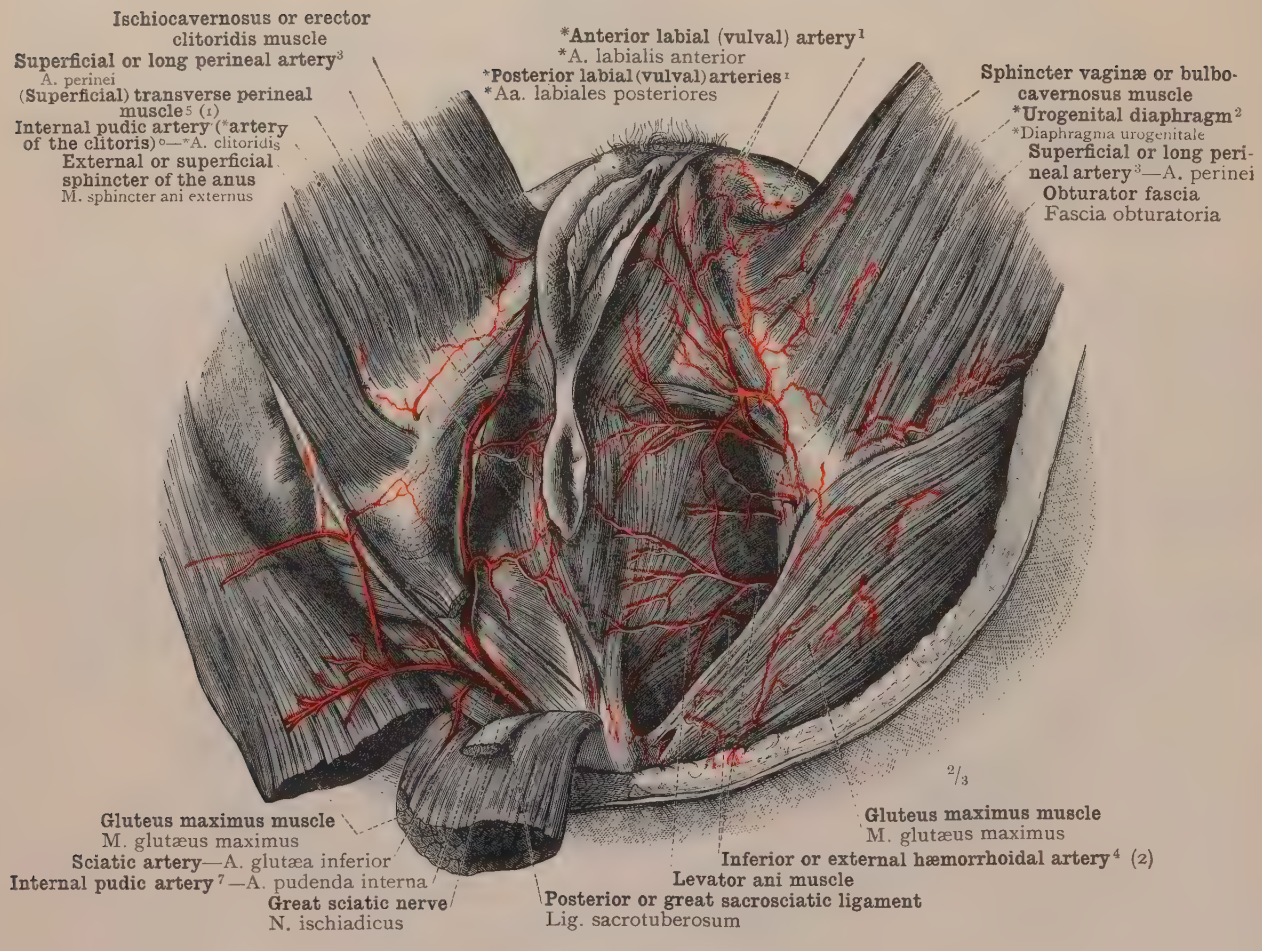
(1) Pars membranacea urethræ

[1] See Appendix, note [152].
[2] See Appendix, note [153].
[3] See Appendix, note [141].
[4] See Appendix, note [139].
[5] See Appendix, notes [147] and [149].
[6] See Appendix, note [154].

FIG. 992.—THE TERMINAL BIFURCATION OF THE INTERNAL PUDIC ARTERY (*ARTERY OF THE PENIS, ACCORDING TO TOLDT—*see Appendix, note* [141]) INTO THE ARTERY OF THE CORPUS CAVERNOSUM (ARTERIA PROFUNDA PENIS) AND THE DORSAL ARTERY OF THE PENIS (ARTERIA DORSALIS PENIS). PRIOR TO THE BIFURCATION, THE FOLLOWING DEEP BRANCHES ARE SUPPLIED: ARTERIA BULBI URETHRÆ, THE ARTERY OF THE BULB; ARTERIA URETHRALIS, THE URETHRAL ARTERY; ARTERIÆ CRURIS PENIS, THE ARTERIES OF THE CRUS PENIS.

On the left side of the body, the superficial layer of the obturator fascia where it covers the internal pudic artery in the ischiorectal fossa has been removed throughout the whole length of Alcock's canal (*see Appendix, note* [145]), so that the artery is exposed up to its disappearance between the layers of the constrictor or compressor urethræ or transversus perinei profundus muscle; on the right side of the body, by the removal of the superficial fibres of that muscle, the artery is exposed in the anterior half of the perineum (called by the author in this part of its course the *artery of the penis, *arteria penis—*see Appendix, note* [141]). The corpus spongiosum, or corpus cavernosum urethræ, has been divided transversely in front of the pubic symphysis, the bulb of the urethra has been separated from the *urogenital diaphragm (*see Appendix, note* [142]) and turned backwards, in order to show the artery of the bulb entering the dorsal (deep) surface of the bulb. The left crus of the penis has been divided transversely and drawn a little outwards, to display more fully the entrance of the branches of the artery of the corpus cavernosum. On the right side the corresponding artery has been traced for some distance within the substance of the corpus cavernosum. Before entering the corpus cavernosum this (right) artery gives an offset which bifurcates in the angle between the two corpora cavernosa, the two branches entering the right and the left corpus cavernosum, respectively.

The Arteries of the Male Perineal Region.



1 See Appendix, note 138.
2 See Appendix, note 142.
3 See Appendix, note 155.
4 Called by Macalister the *anal artery.*
5 See note 1 to p. 527 in Part IV.
6 See Appendix, note 156.
7 See Appendix, note 139.

FIG. 993.—THE SUPERFICIAL BRANCHES OF THE INTERNAL PUDIC ARTERY, ARTERIA PUDENDA INTERNA, IN THE FEMALE PERINEAL REGION: THE INFERIOR OR EXTERNAL HÆMORRHOIDAL ARTERY (ANAL ARTERY, ACCORDING TO MACALISTER), ARTERIA HÆMORRHOIDALIS INFERIOR, AND THE *PERINEAL ARTERY (*i.e.*, TRANSVERSE PERINEAL ARTERY AND SUPERFICIAL OR LONG PERINEAL ARTERY—*see Appendix, notes* 147, 149, *and* 155), ARTERIA PERINEI, WITH THE TERMINATION OF THE SUPERFICIAL OR LONG PERINEAL ARTERY BY ITS DIVISION INTO THE POSTERIOR LABIAL ARTERIES, ARTERIÆ LABIALES POSTERIORES (*see Appendix, note* 138).

On the right side of the body the gluteus maximus muscle was partially divided by an incision passing upwards from its lower border, and was turned upwards; the posterior or great sacrosciatic ligament, ligamentum sacrotuberosum, was cut completely across, and turned upwards with the gluteus maximus muscle. By the removal of the superficial layer of the obturator fascia where it covers the internal pudic artery in Alcock's canal (*see Appendix, note* 145), that canal was opened throughout, and the artery was exposed from its point of emergence from the pelvis to the point at which it perforates the base of the triangular ligament (or, in the author's terminology, to the point at which it enters the *urogenital diaphragm—*see Appendix, note* 142).

The Arteries of the Female Perineal Region.

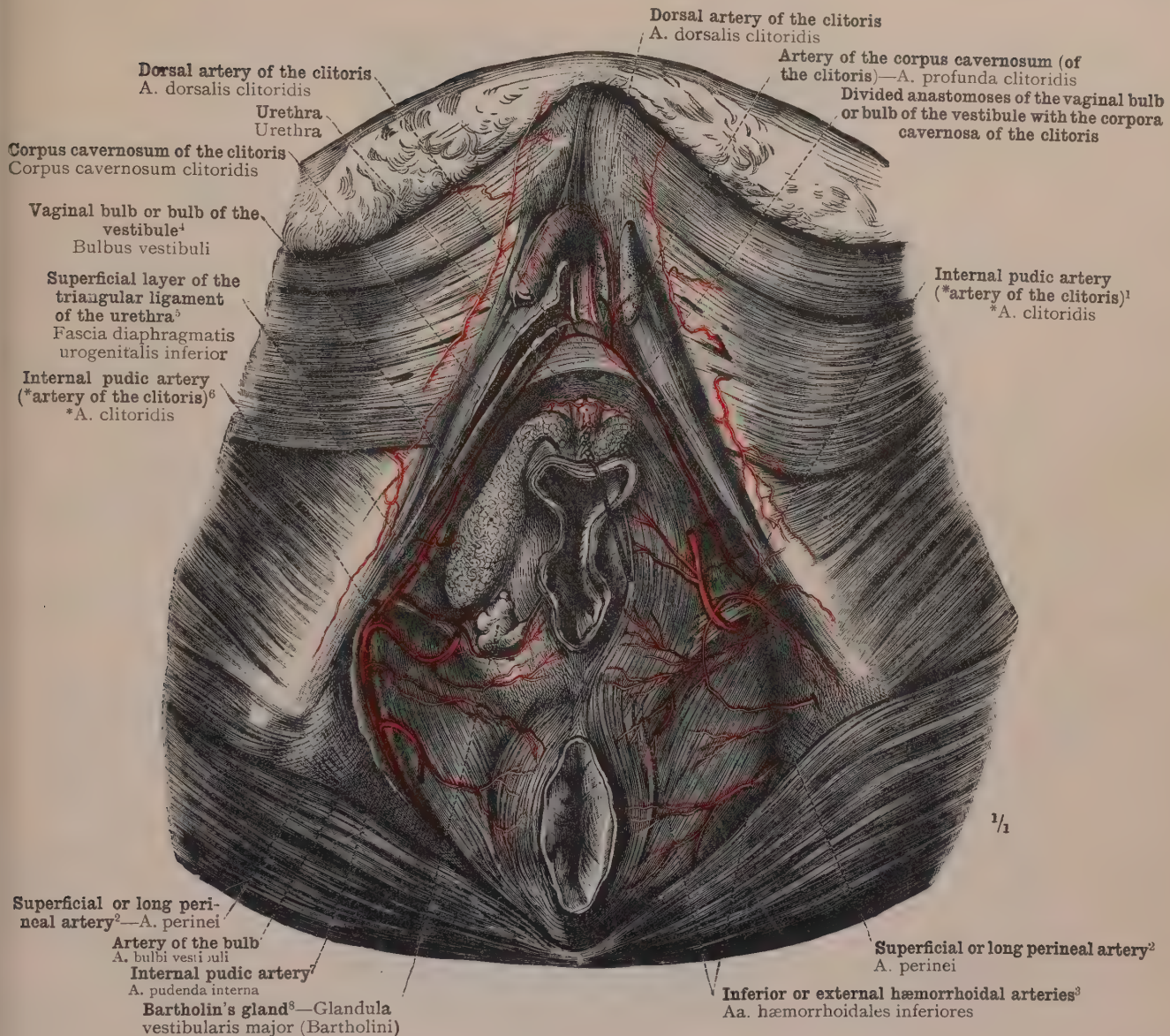
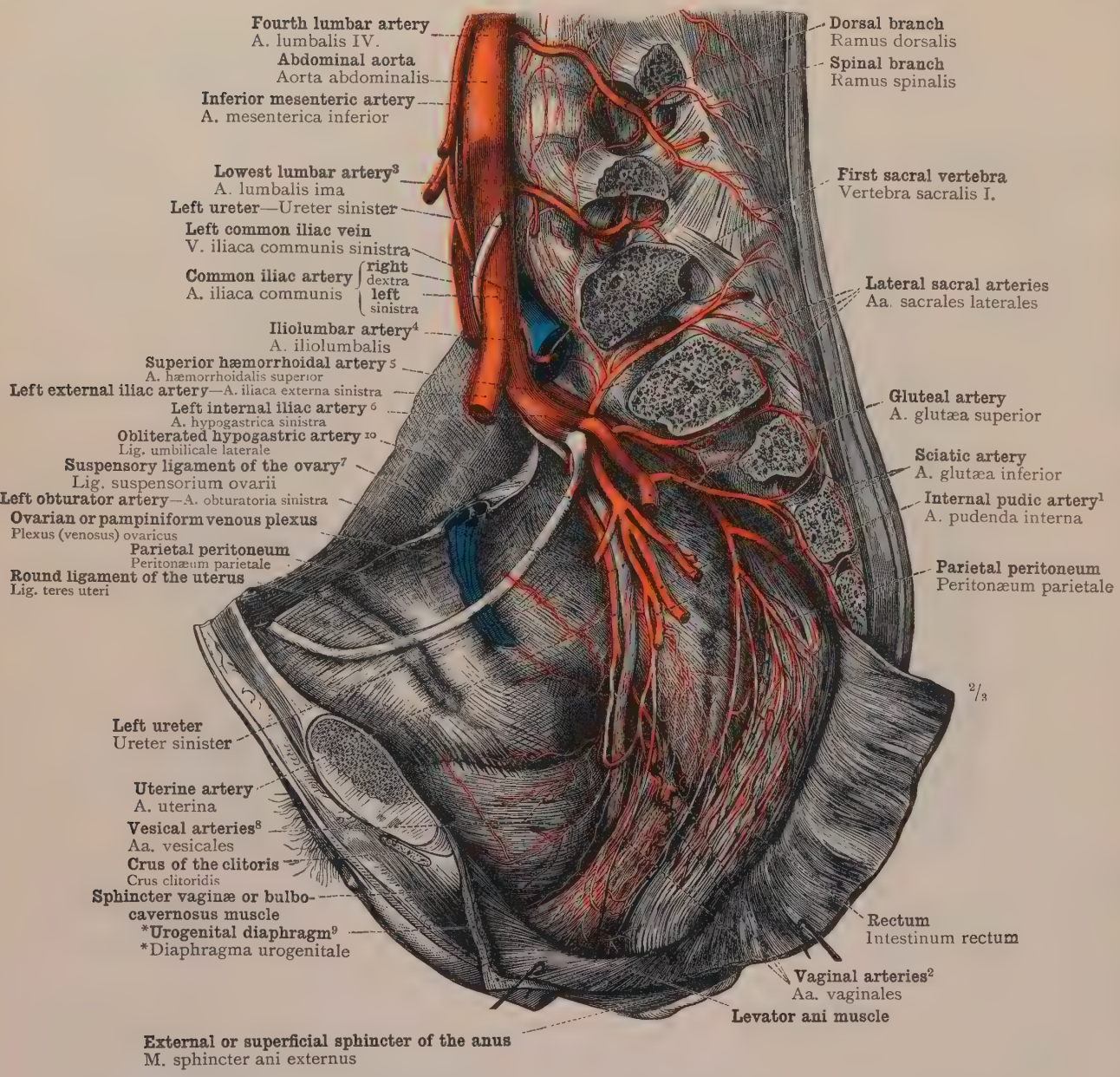

Dorsal artery of the clitoris
A. dorsalis clitoridis
Dorsal artery of the clitoris
A. dorsalis clitoridis
Artery of the corpus cavernosum (of the clitoris)—A. profunda clitoridis
Divided anastomoses of the vaginal bulb or bulb of the vestibule with the corpora cavernosa of the clitoris
Urethra
Urethra
Corpus cavernosum of the clitoris
Corpus cavernosum clitoridis
Vaginal bulb or bulb of the vestibule[4]
Bulbus vestibuli
Superficial layer of the triangular ligament of the urethra[5]
Fascia diaphragmatis urogenitalis inferior
Internal pudic artery (*artery of the clitoris)[6]
*A. clitoridis
Internal pudic artery (*artery of the clitoris)[1]
*A. clitoridis
1/1
Superficial or long perineal artery[2]—A. perinei
Artery of the bulb
A. bulbi vestibuli
Internal pudic artery[7]
A. pudenda interna
Bartholin's gland[8]—Glandula vestibularis major (Bartholini)
Superficial or long perineal artery[2]
A. perinei
Inferior or external hæmorrhoidal arteries[3]
Aa. hæmorrhoidales inferiores

FIG. 994.—THE DEEP BRANCHES OF THE INTERNAL PUDIC ARTERY, ARTERIA PUDENDA EXTERNA IN THE UROGENITAL REGION,[9] REGIO UROGENITALIS, OF THE FEMALE PERINEAL REGION. THE BRANCHES OF THE *ARTERY OF THE CLITORIS, ARTERIA CLITORIDIS (*see Appendix, note* [156]): THE ARTERY OF THE BULB, ARTERIA BULBI VESTIBULÆ (VAGINÆ); THE ARTERY OF THE CORPUS CAVERNOSUM (OF THE CLITORIS), ARTERIA PROFUNDA CLITORIDIS; AND THE DORSAL ARTERY OF THE CLITORIS, ARTERIA DORSALIS CLITORIDIS. THE DORSAL ARTERIES OF THE CLITORIS, ARTERIÆ DORSALES CLITORIDIS, ARE CONNECTED WITH ONE ANOTHER BY AN ANASTOMOTIC ARCH SITUATE ON THE SUPERFICIAL SURFACE OF THE INFERIOR PUBIC OR SUBPUBIC LIGAMENT (LIGAMENTUM ARCUATUM PUBIS).

In the preparation shown in Fig. 993, the labia majora and the labia minora or nymphæ were removed by a frontal section; on the right side of the body the sphincter vaginæ or bulbocavernosus muscle and the (superficial) transverse muscle of the perineum (*see note* [1] *to p.* 527 *in Part IV.*) were removed, the anastomoses between the vaginal bulb or bulb of the vestibule and the clitoris were divided, and the passage of the urethra through the *urogenital diaphragm (*see Appendix, note* [142]) was displayed by drawing the vagina backwards. The right corpus cavernosum of the clitoris was divided by a longitudinal section commencing at the point of entry of the artery of that body (arteria profunda clitoridis), and this artery was traced for some distance within its substance. The left corpus cavernosum was divided transversely at the point of entry of its artery (arteria profunda clitoridis), and by separating the segments of the crus the course of the dorsal artery of the clitoris, arteria dorsalis clitoridis, to its destination was exposed.

1 See Appendix, note 156. 2 See Appendix, note 157. 3 See Appendix, note 158. 4 See Appendix, note 159.
5 See Appendix to Part IV., note 99. 6 See Appendix, note 156. 7 See Appendix, note 139.
8 Known also as *Duverney's gland*, or the *suburethral gland*. (See Appendix to Part IV., note 66.)—TR.
9 Generally known in England as the *anterior half of the perineal space*.—TR.

The Arteries of the Female Perineal Region.

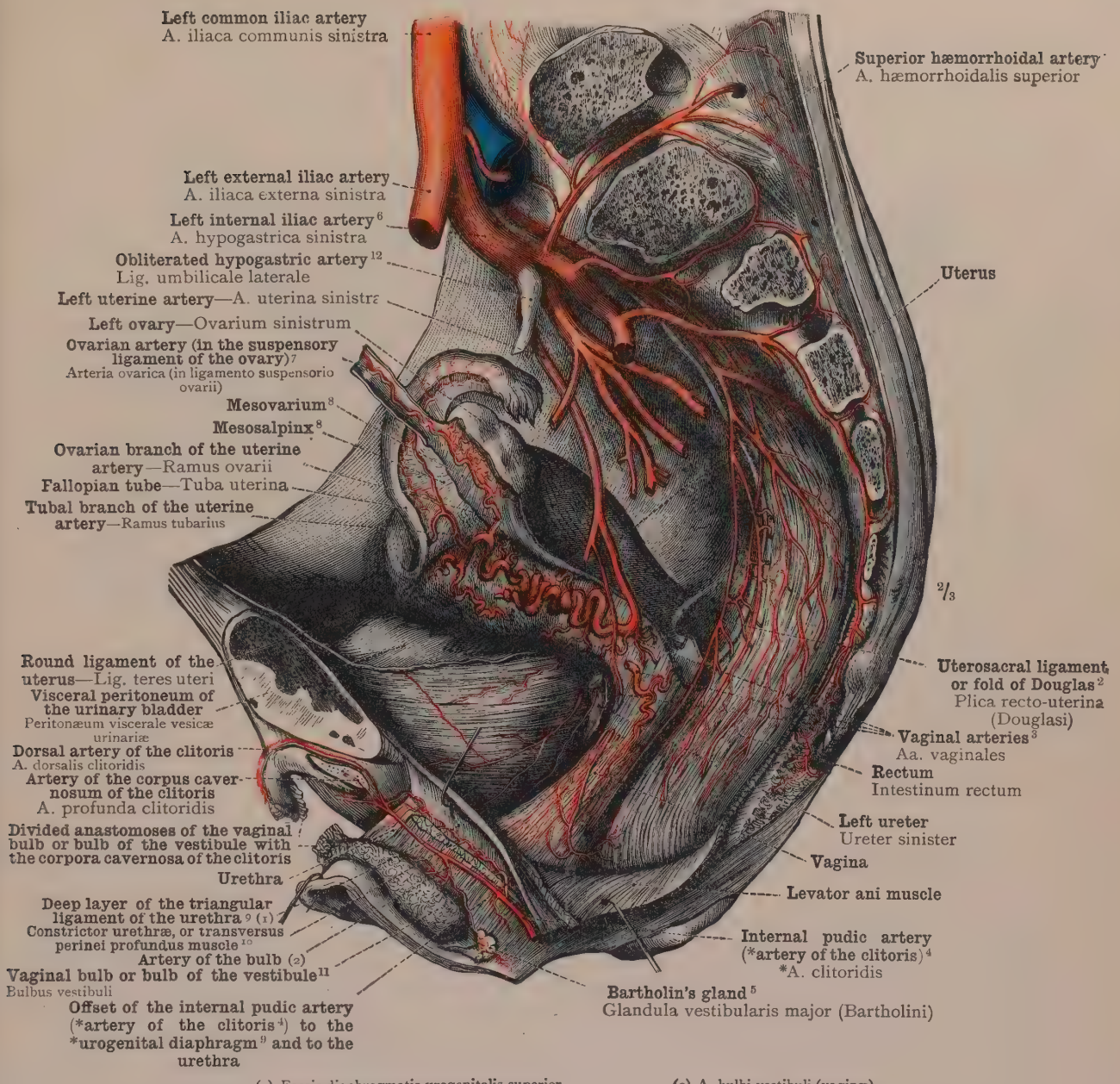


[1] See Appendix, note [139]. [2] See Appendix, note [160]. [3] See Appendix, note [125]. [4] See Appendix, note [161].
[5] Called by Macalister the *superior rectal artery*. [6] See Appendix, note [120].
[7] Called also the *infundibulopelvic* or *ovariopelvic fold* or *ligament*. [8] See Appendix, note [162]. [9] See Appendix, note [142].
[10] Or **external umbilical ligament*—see Appendix, note [148].

FIG. 995.—THE LEFT INTERNAL ILIAC ARTERY, ARTERIA HYPOGASTRICA (*see Appendix, note* [120]), AND ITS VISCERAL BRANCHES, RAMI VISCERALES, SEEN IN THE SUBPERITONEAL SPACE OF A FEMALE PELVIS: THE LOWEST OFFSETS OF THE SUPERIOR HÆMORRHOIDAL OR SUPERIOR RECTAL ARTERY, ARTERIA HÆMORRHOIDALIS SUPERIOR; THE UTERINE ARTERY, ARTERIA UTERINA, AS FAR AS ITS POINT OF ENTRANCE INTO THE BROAD LIGAMENT OF THE UTERUS (MESOMETRIUM); THE VAGINAL ARTERIES, ARTERIÆ VAGINALES (*see Appendix, note* [160]); THE TERMINAL OFFSETS TO THE BLADDER, ARTERIÆ VESICALES (*see Appendix, note* [162]), AND TO THE URETER. OF THE PARIETAL BRANCHES, RAMI PARIETALES, THE LATERAL SACRAL ARTERIES, ARTERIÆ SACRALES LATERALES, AND THE TWO LOWERMOST LUMBAR ARTERIES, ARTERIÆ LUMBALES, HAVE BEEN PRESERVED; THE SPINAL BRANCHES HAVE BEEN TRACED UP TO THEIR ENTRANCE INTO THE SPINAL CANAL.

The left lateral wall of the pelvis was removed by a section which in front passed close to the median plane, and behind, through the left row of sacral foramina; but the parietal peritoneal investment of this wall was preserved up to its reflection on to the urinary bladder, the vagina, and the rectum. The parts of these organs situate outside the peritoneum were laid bare, and the pelvic diaphragm (*see Appendix, note* [140]) was turned downwards.

The Arteries of the Female Pelvic Viscera.


Left common iliac artery
A. iliaca communis sinistra
Superior hæmorrhoidal artery
A. hæmorrhoidalis superior
Left external iliac artery
A. iliaca externa sinistra
Left internal iliac artery [6]
A. hypogastrica sinistra
Obliterated hypogastric artery [12]
Lig. umbilicale laterale
Uterus
Left uterine artery—A. uterina sinistra
Left ovary—Ovarium sinistrum
Ovarian artery (in the suspensory ligament of the ovary) [7]
Arteria ovarica (in ligamento suspensorio ovarii)
Mesovarium [8]
Mesosalpinx [8]
Ovarian branch of the uterine artery—Ramus ovarii
Fallopian tube—Tuba uterina
Tubal branch of the uterine artery—Ramus tubarius
2/3
Round ligament of the uterus—Lig. teres uteri
Visceral peritoneum of the urinary bladder
Peritonæum viscerale vesicæ urinariæ
Uterosacral ligament or fold of Douglas [2]
Plica recto-uterina (Douglasi)
Dorsal artery of the clitoris
A. dorsalis clitoridis
Vaginal arteries [3]
Aa. vaginales
Artery of the corpus cavernosum of the clitoris
A. profunda clitoridis
Rectum
Intestinum rectum
Divided anastomoses of the vaginal bulb or bulb of the vestibule with the corpora cavernosa of the clitoris
Left ureter
Ureter sinister
Urethra
Vagina
Deep layer of the triangular ligament of the urethra [9] (1)
Constrictor urethræ, or transversus perinei profundus muscle [10]
Levator ani muscle
Artery of the bulb (2)
Vaginal bulb or bulb of the vestibule [11]
Bulbus vestibuli
Internal pudic artery (*artery of the clitoris) [4]
*A. clitoridis
Offset of the internal pudic artery (*artery of the clitoris [4]) to the *urogenital diaphragm [9] and to the urethra
Bartholin's gland [5]
Glandula vestibularis major (Bartholini)

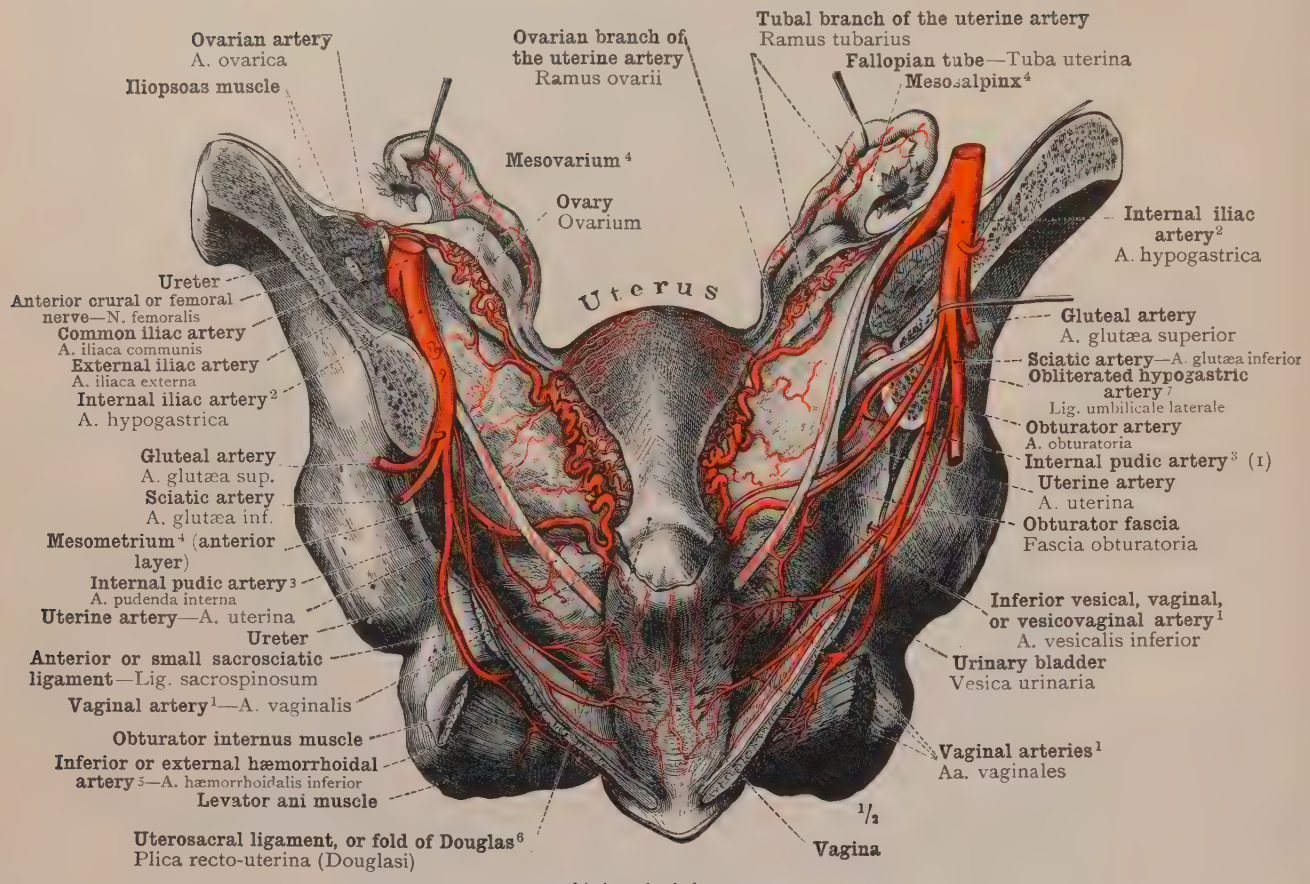
(1) Fascia diaphragmatis urogenitalis superior (2) A. bulbi vestibuli (vaginæ)

1 Called by Macalister the *superior rectal artery*.
2 Known also as the *recto-uterine fold* or *ligament*.
3 See Appendix, note 160.
4 See Appendix, note 156.
5 Known also as *Duverney's gland*, or the *suburethral gland*. (See Appendix to Part IV., note 66.)
6 See Appendix, note 120.
7 The *suspensory ligament of the ovary* is known also as the *infundibulopelvic ligament* or *ovariopelvic fold* or *ligament*.—Tr.
8 See Appendix to Part IV , note 82.
9 See Appendix to Part IV., note 99.
10 *M. Transversus Perinei Profundus*.—For an account of the nomenclature of this muscle see Appendix to Part IV., note 101.—Tr.
11 *Bulbus Vestibuli*.—Regarding the nomenclature of this structure, see Appendix to Part IV., note 91—Tr.
12 Or **external umbilical ligament*—see Appendix, note 148.

FIG. 996.—THE DISTRIBUTION OF THE LATERAL SACRAL ARTERIES, ARTERIÆ SACRALES LATERALES, THE SUPERIOR HÆMORRHOIDAL OR SUPERIOR RECTAL ARTERY, ARTERIA HÆMORRHOIDALIS SUPERIOR, THE UTERINE ARTERY, ARTERIA UTERINA, THE OVARIAN ARTERY, ARTERIA OVARICA, AND THE DISTAL PORTION OF THE INTERNAL PUDIC ARTERY, *ARTERIA CLITORIDIS (*see Appendix, note* 156).

In the preparation shown in Fig. 995, the parietal peritoneum was cut away along the line of its reflection on to the rectum and the urinary bladder, and the mesometrium (*i.e.*, the broad ligament of the uterus) was severed along its attachment to the uterus, the Fallopian tube with its mesentery (the mesosalpinx) and also the suspensory ligament of the ovary were turned inwards and upwards, while the mesovarium was turned upwards and backwards, the lower layer of the latter was removed, and the ovarian artery with its ovarian offsets and its anastomosis with the uterine artery was displayed. The deep layer of the triangular ligament of the urethra was detached from the deep transverse perineal muscle and was drawn upwards, in order to show the branch of the internal pudic artery running forwards on the superficial surface of this deep layer. From a transversely disposed arch formed by the anastomosis of this branch with the corresponding vessel of the opposite side, several small offsets arise, which run forwards (downwards) along the urethra. By the removal of the superficial layer of the triangular ligament of the urethra the internal pudic artery (arteria clitoridis—*see Appendix, note* 156) was exposed up to its terminal bifurcation.

The Arteries of the Female Pelvic Viscera.



(1) A. pudenda interna

1 See Appendix, note [163]. 2 See Appendix, note [120]. 3 See Appendix, note [139]. 4 See Appendix to Part IV., note [82].
5 Called by Macalister the *anal artery*. 6 Known also as the *recto-uterine fold* or *ligament*.
7 Or *external umbilical ligament*—see Appendix, note [148].

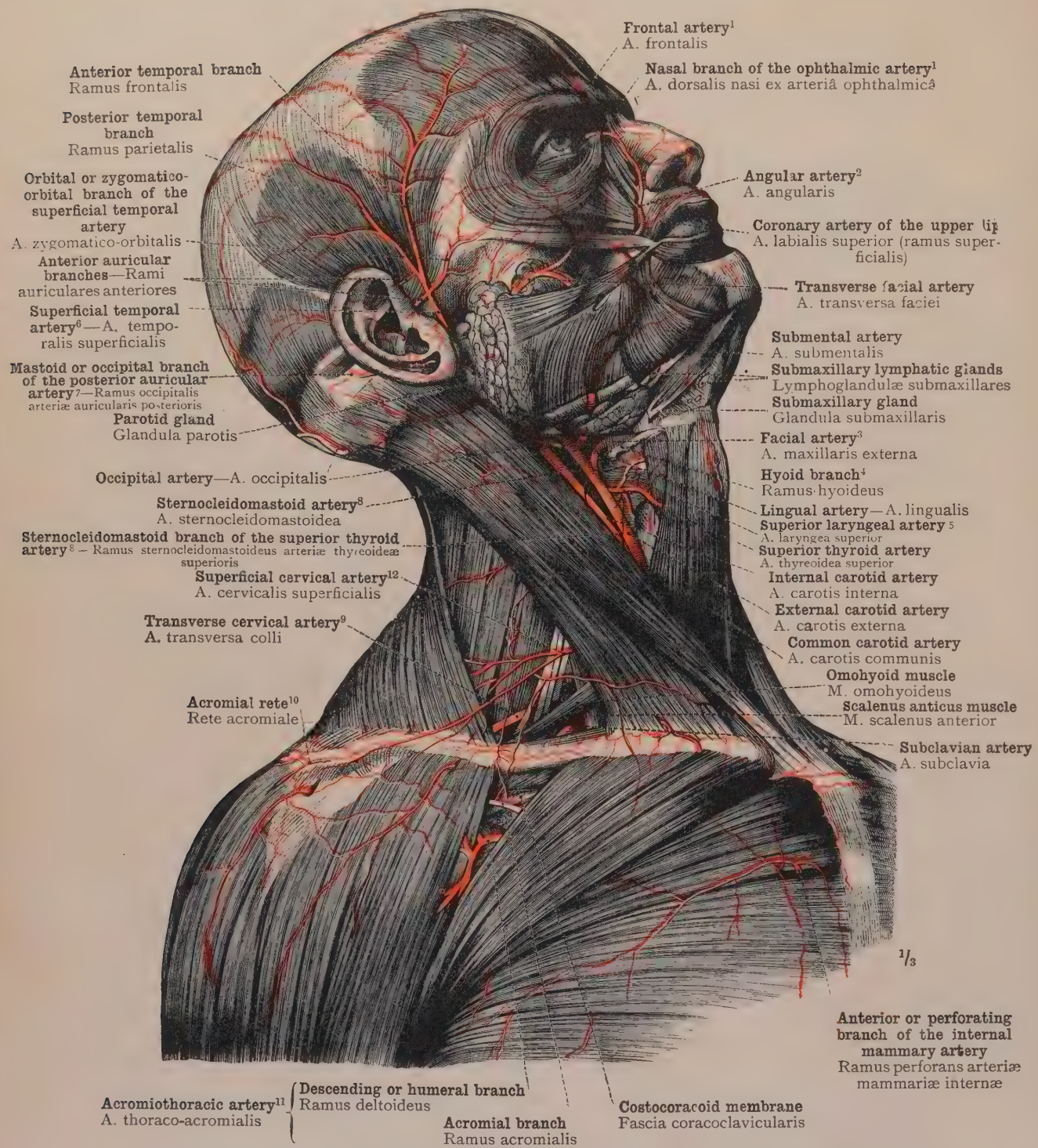
FIG. 997.—THE ARTERIES OF THE UTERUS, THE OVARIES, THE FALLOPIAN TUBES, THE VAGINA, AND THE URINARY BLADDER, SEEN FROM BEHIND: THE OVARIAN ARTERY, ARTERIA OVARICA (ARTERIA SPERMATICA INTERNA); THE UTERINE ARTERY, ARTERIA UTERINA, WITH ITS OFFSETS TO THE OVARY (RAMUS OVARII), THE FALLOPIAN TUBE (RAMUS TUBARIUS), THE VAGINA ARTERIÆ VAGINALES—*see Appendix, note* [163]), AND TO THE BLADDER (ARTERIA VESICALIS INFERIOR)—*i.e.*, THE INFERIOR VESICAL, VAGINAL, OR VESICOVAGINAL ARTERY (IN THIS SPECIMEN ARISING FROM THE UTERINE ARTERY, INSTEAD OF, AS USUALLY, ARISING SEPARATELY FROM THE ANTERIOR DIVISION OF THE INTERNAL ILIAC ARTERY—*see Appendix, note* [163]); THE INTERNAL PUDIC ARTERY, ARTERIA PUDENDA INTERNA, AND ITS OFFSETS TO THE VAGINA (*see Appendix, note* [163]). THE PELVIC PORTION OF THE URETER, AND ITS RELATIONS TO THE UTERINE ARTERY, THE CERVIX UTERI, THE VAGINA, AND THE URINARY BLADDER.

By a frontal section passing on each side through the great sacrosciatic foramen, the posterior wall of the pelvis was removed, in order to display (after removing the rectum) the uterus and the vagina, and, in addition, the lateral parts of the bladder. The uterus and the vagina were drawn upwards, the ovaries upwards and forwards; the lower layer of the mesovarium and the hinder layer of the mesometrium were removed, and the ureters, thus exposed, were preserved as nearly as possible in their natural position. The right internal iliac artery was drawn outwards and backwards, to display more fully the origin of its branches and that of the obliterated hypogastric artery (*see note* [7] *above*). The branches of the posterior division of the artery have been cut away near their origin, and the internal pudic artery has on both sides been traced as far as its passage through the small sacrosciatic foramen.

The Arteries of the Female Pelvic Viscera.

ARTERIÆ COLLI ET CAPITIS

THE ARTERIES OF THE HEAD AND NECK

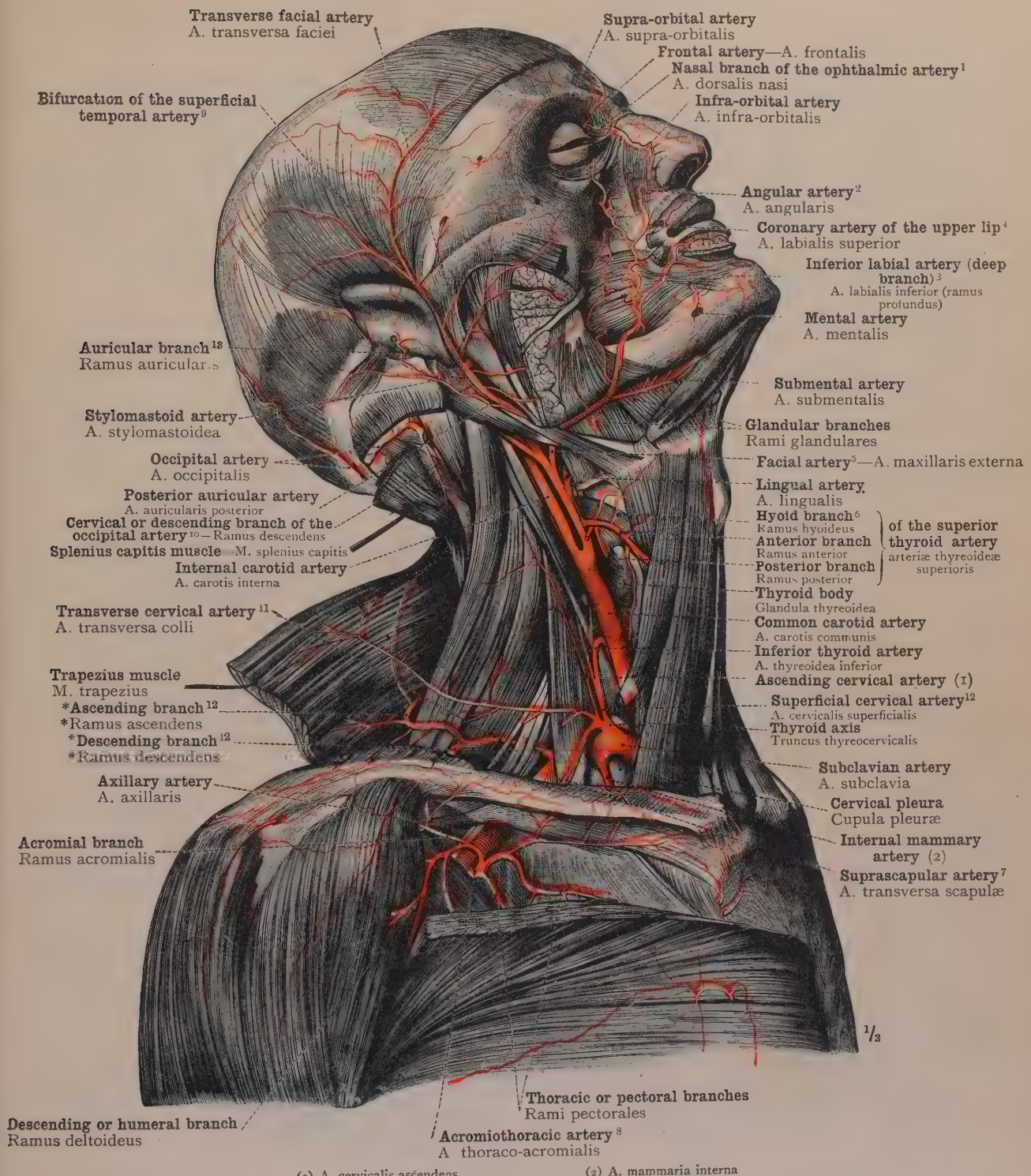


1 See Appendix, note 164. 2 See Appendix, note 165. 3 See Appendix, note 166. 4 See Appendix, note 167.
5 Or *laryngeal branch* of the *superior thyroid artery*. 6 See Appendix, note 168.
7 Called by Macalister the *posterior terminal branch* of the *posterior auricular artery*. 8 See Appendix, note 169.
9 Or *posterior scapular artery* (Macalister). See Appendix, note 172.—Tr. 10 See Appendix, note 170.
11 Called by Macalister the *thoracico-acromial artery*. 12 See Appendix, note 172.

FIG. 998.—SUPERFICIAL ARTERIES OF THE HEAD AND NECK, AND OF THE UPPER PART OF THE PECTORAL REGION AND THE SHOULDER; SEEN FROM THE RIGHT SIDE.

Over the anterior part of the parotid gland, the parotideomasseteric fascia has been left intact. The lower ends of the levator labii superioris alæque nasi, levator labii superioris proprius, and zygomaticus minor muscles have been removed, to display the facial artery and the origin of the coronary artery of the upper lip.

The Superficial Branches of the External Carotid, Subclavian and Axillary Arteries.

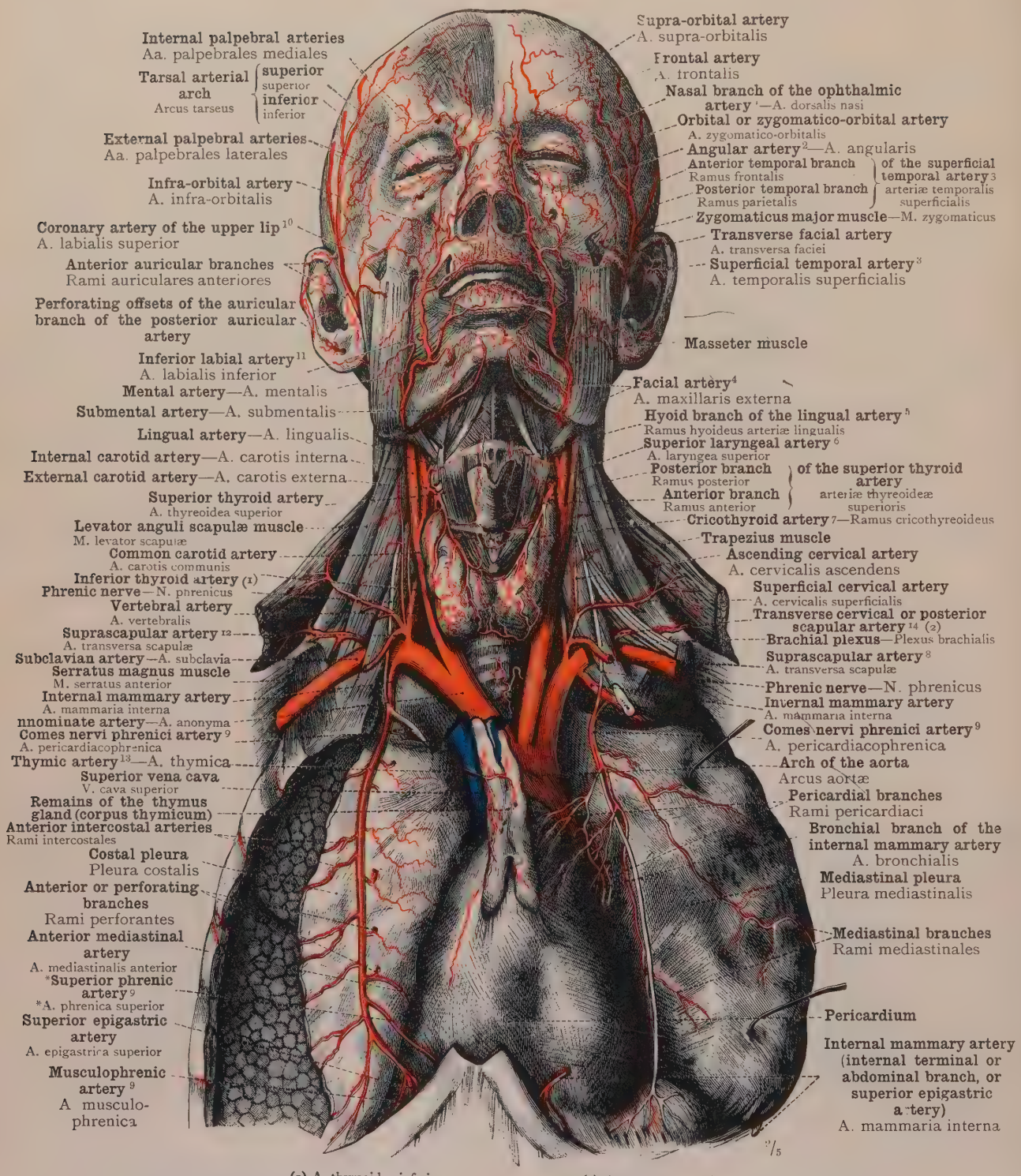


(1) A. cervicalis ascendens (2) A. mammaria interna

[1] See Appendix, note [164].
[2] See Appendix, note [165].
[3] See Appendix, note [171].
[4] Called by Macalister the *superior coronary artery.*
[5] See Appendix, note [166].
[6] Called by Macalister the *infrahyoidean artery.*
[7] Known also as the *transverse scapular* or *transverse humeral artery.*
[8] Called by Macalister the *thoracico-acromial artery.*
[9] See Appendix, note [168].
[10] Known also as the *ramus cervicalis princeps,* or *arteria princeps cervicis.*
[11] Or *posterior scapular artery* (Macalister).
[12] See Appendix, note [172].
[13] Called by Macalister the *anterior terminal* branch of the *posterior auricular artery.*

FIG. 999.—IN THE PREPARATION SHOWN IN FIG. 998, THE SUPERFICIAL MUSCLES OF THE FACE, THE HINDER PART OF THE PAROTID GLAND, THE SUBMAXILLARY GLAND, THE STERNOCLEIDOMASTOID MUSCLE, THE UPPER PART OF THE CLAVICULAR PORTION INFERIOR (POSTERIOR) BELLY OF THE OMOHYOID MUSCLE, THE UPPER PART OF THE CLAVICULAR PORTION OF THE PECTORALIS MAJOR MUSCLE, AND THE DEEP LAYER OF THE PECTORAL FASCIA, WERE REMOVED. THE ORBICULARIS ORIS MUSCLE WAS INCISED ABOVE AND BELOW THE APERTURE OF THE MOUTH (RIMA ORIS) AND PARALLEL WITH THAT APERTURE. THE INCISION PENETRATING TO THE LABIAL GLANDS, IN ORDER TO EXPOSE THE CORONARY ARTERIES OF THE LIPS.

The Deep Branches of the External Carotid, Subclavian, and Axillary Arteries.

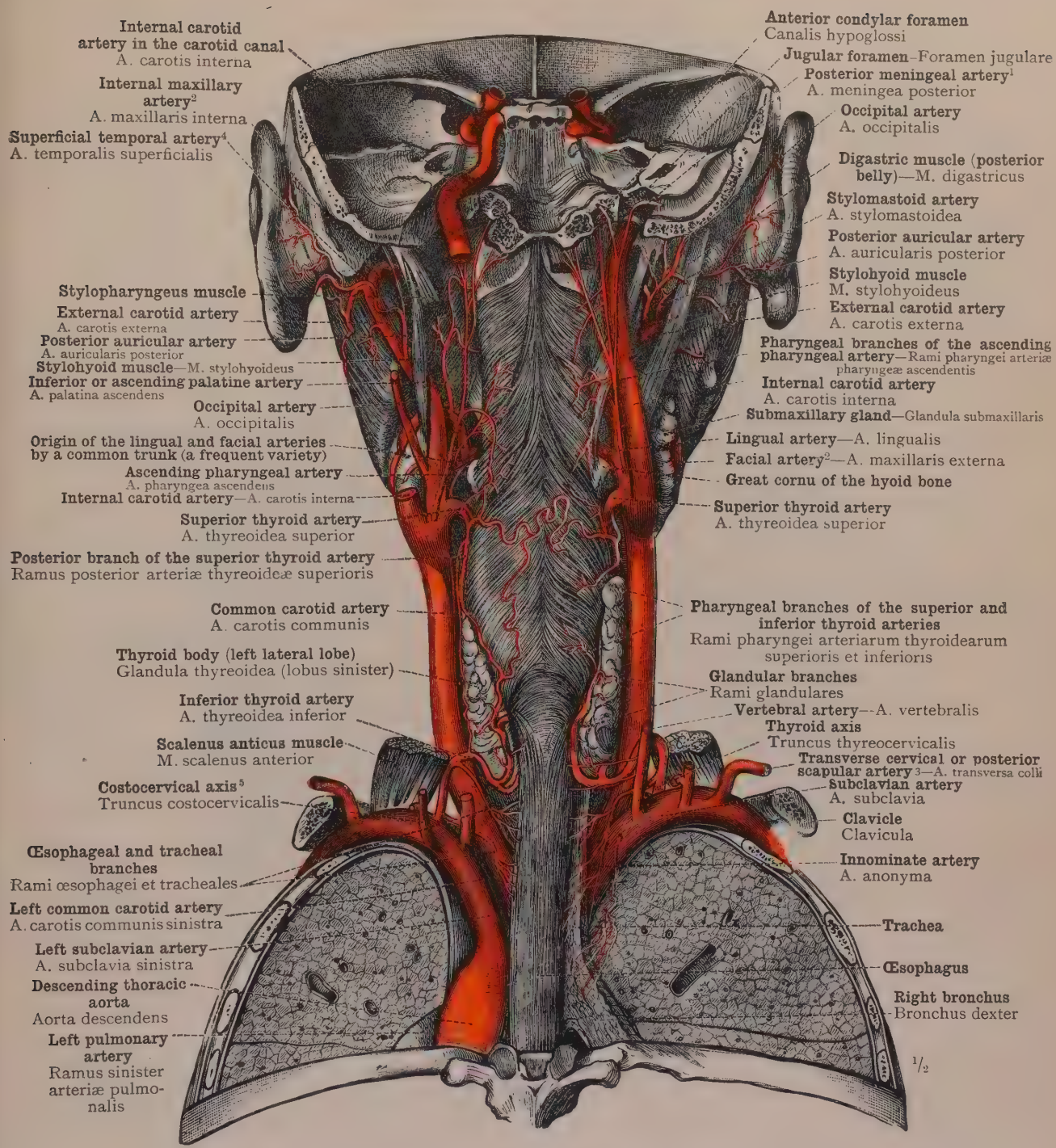


(1) A. thyreoidea inferior (2) A. transversa colli

[1] See Appendix, note 164. [2] See Appendix, note 165. [3] See Appendix, note 168. [4] See Appendix, note 166.
[5] Called by Macalister the *suprahyoidean* artery. See Appendix, note 167. [6] Or *laryngeal branch* of the *superior thyroid artery*.
[7] See Appendix, note 173. [8] Known also as the *transverse scapular* or *transverse humeral artery*.
[9] See Appendix, note 174. [10] Called by Macalister the *superior coronary artery*. [11] See Appendix, note 171.
[12] Called also the *transverse scapular* or *transverse humeral artery*. [13] See Appendix, note 175.
[14] See Appendix, note 172.

FIG. 1000.—ON THE RIGHT SIDE OF THE BODY, THE COSTAL PLEURA AND THE LUNG HAVE BEEN PUSHED SOMEWHAT BACKWARDS; AND BETWEEN THE INTERNAL MAMMARY ARTERY AND THE ANTERIOR CUT SURFACES OF THE RIBS THE COSTAL PLEURA HAS BEEN REMOVED, EXPOSING THE SURFACE OF THE LUNG. THE LEFT LAYER OF THE MEDIASTINUM HAS BEEN SEPARATED FROM ITS ATTACHMENTS AS FAR BACK AS THE ROOT OF THE LUNG, AND HAS BEEN DRAWN OUTWARDS WITH THAT ORGAN.

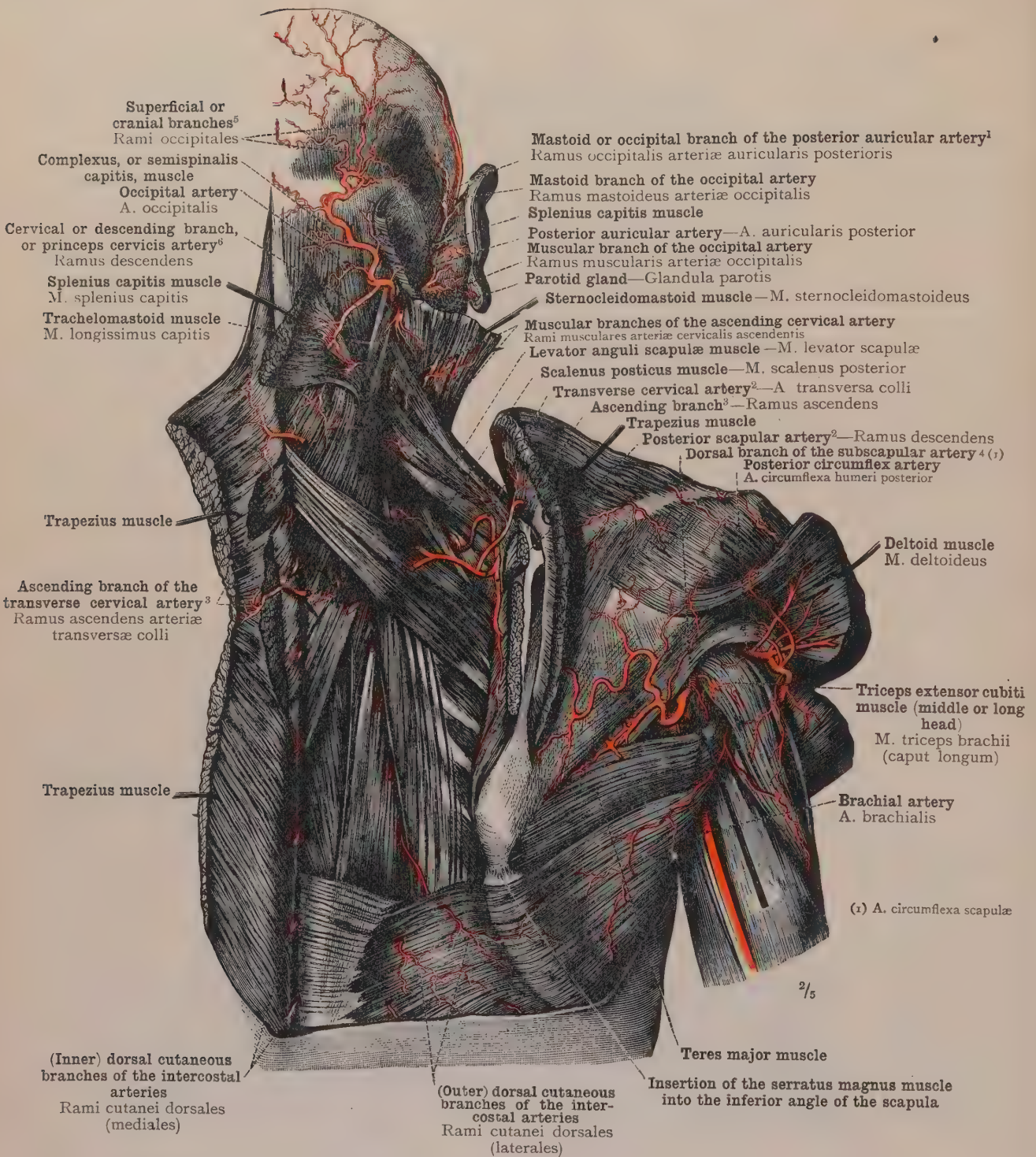
The Distribution of the Branches of the Arch of the Aorta in the Head and Neck, and the Distribution of the Internal Mammary Artery.



[1] See Appendix, note [176]. [2] See Appendix, note [166]. [3] See Appendix, note [172]. [4] See Appendix, note [168]. [5] See Appendix, note [177].

FIG. 1001.—THE BRANCHES OF THE ARCH OF THE AORTA AND THE ARTERIES OF THE NECK, SEEN FROM BEHIND. THE ARTERIES OF THE PHARYNX: THE ASCENDING PHARYNGEAL ARTERY, ARTERIA PHARYNGEA ASCENDENS, ITS PHARYNGEAL BRANCHES, RAMI PHARYNGEI, AND ITS MENINGEAL BRANCH (*see Appendix, note* [176]), ARTERIA MENINGEA POSTERIOR, TO THE HINDER PART OF THE DURA MATER; THE PHARYNGEAL BRANCHES, RAMI PHARYNGEI, OF THE SUPERIOR AND INFERIOR THYROID ARTERIES; THE ŒSOPHAGEAL AND TRACHEAL BRANCHES, RAMI ŒSOPHAGEI ET TRACHEALES, OF THE INFERIOR THYROID ARTERY.

Arteria subclavia, the subclavian artery, arteria carotis communis, the common carotid artery, arteria carotis interna, the internal carotid artery; the arteries of the pharynx, the trachea, and the œsophagus.

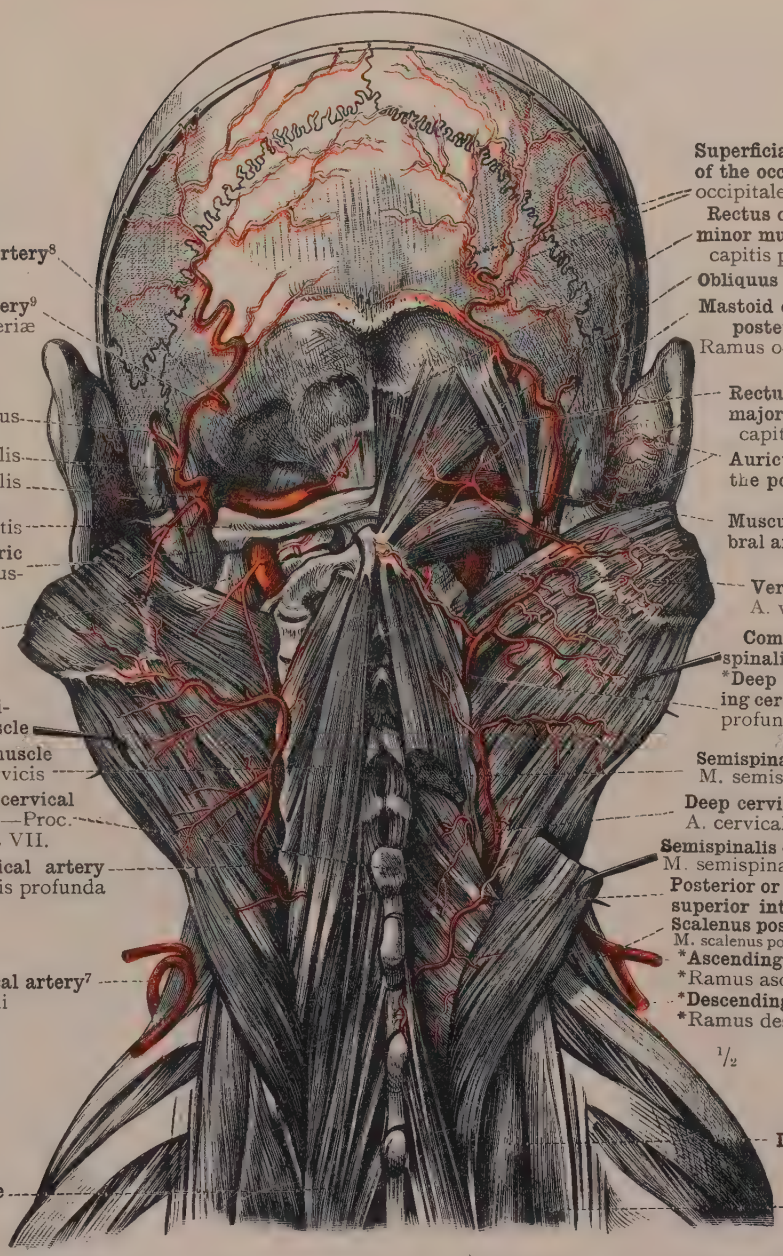

Superficial or cranial branches[5] Rami occipitales
Complexus, or semispinalis capitis, muscle
Occipital artery A. occipitalis
Cervical or descending branch, or princeps cervicis artery[6] Ramus descendens
Splenius capitis muscle M. splenius capitis
Trachelomastoid muscle M. longissimus capitis
Trapezius muscle
Ascending branch of the transverse cervical artery[3] Ramus ascendens arteriæ transversæ colli
Trapezius muscle
(Inner) dorsal cutaneous branches of the intercostal arteries Rami cutanei dorsales (mediales)
(Outer) dorsal cutaneous branches of the intercostal arteries Rami cutanei dorsales (laterales)
Teres major muscle
Insertion of the serratus magnus muscle into the inferior angle of the scapula
Mastoid or occipital branch of the posterior auricular artery[1] Ramus occipitalis arteriæ auricularis posterioris
Mastoid branch of the occipital artery Ramus mastoideus arteriæ occipitalis
Splenius capitis muscle
Posterior auricular artery—A. auricularis posterior
Muscular branch of the occipital artery Ramus muscularis arteriæ occipitalis
Parotid gland—Glandula parotis
Sternocleidomastoid muscle—M. sternocleidomastoideus
Muscular branches of the ascending cervical artery Rami musculares arteriæ cervicalis ascendentis
Levator anguli scapulæ muscle—M. levator scapulæ
Scalenus posticus muscle—M. scalenus posterior
Transverse cervical artery[2]—A. transversa colli
Ascending branch[3]—Ramus ascendens
Trapezius muscle
Posterior scapular artery[2]—Ramus descendens
Dorsal branch of the subscapular artery[4] (1)
Posterior circumflex artery A. circumflexa humeri posterior
Deltoid muscle M. deltoideus
Triceps extensor cubiti muscle (middle or long head) M. triceps brachii (caput longum)
Brachial artery A. brachialis
(1) A. circumflexa scapulæ
2/5

[1] Called by Macalister the *posterior terminal branch* of the *posterior auricular artery*.
[2] See Appendix, note 172.
[3] In Macalister's terminology this is the *cervical branch* of the *transverse cervical* or *posterior scapular artery*.
[4] Commonly known in England as the *dorsalis scapulæ artery*. See Appendix, note 172.
[5] Called by Macalister the *external* and *internal terminal branches* of the *occipital artery*.
[6] Or *ramus cervicalis princeps arteriæ occipitalis*.

FIG. 1002.—THE DEEP ARTERIES OF THE RIGHT NUCHAL REGION AND THE BACK OF THE RIGHT SHOULDER; SEEN FROM BEHIND.

The scapula was drawn a little away from the trunk; a horizontal incision was made through the posterior half of the deltoid muscle a little above the middle of its vertical extent, and the muscle was turned forwards; the teres major muscle was drawn somewhat downwards. The superficial offsets only of the dorsal branch of the subscapular artery (dorsalis scapulæ artery—arteria circumflexa scapulæ) are seen, on the surface of the infraspinous fascia; the deeper branches of this artery, ramifying beneath the infraspinatus muscle, are shown in Fig. 1010.

Arteria occipitalis, the occipital artery; arteria transversa colli, the transverse cervical (or posterior scapular) artery; arteria circumflexa scapulæ, the dorsal branch of the subscapular or dorsalis scapulæ artery; and arteria circumflexa humeri posterior, the posterior circumflex artery (of the arm).



Cervical or descending branch, or princeps cervicis artery[8] Ramus descendens

Posterior meningeal artery[9] Ramus meningeus arteriæ vertebralis

Mastoid branch Ramus mastoideus

Occipital artery—A. occipitalis

Vertebral artery—A. vertebralis

Transverse process of the atlas—Proc. transversus atlantis

Posterior belly of the digastric muscle—Venter posterior musculi digastrici

Levator anguli scapulæ muscle M. levator scapulæ

Complexus, or semispinalis capitis, muscle

Semispinalis colli muscle M. semispinalis cervicis

Spinous process of the seventh cervical vertebra (vertebra prominens)—Proc. spinosus vertebræ cervicalis VII.

Deep cervical artery A. cervicalis profunda

Transverse cervical artery[7] A. transversa colli

Semispinalis dorsi muscle

Superficial or cranial branches of the occipital artery[1]—Rami occipitales arteriæ occipitalis

Rectus capitis posticus minor muscle—M. rectus capitis posterior minor

Obliquus capitis superior muscle

Mastoid or occipital branch of the posterior auricular artery[2] Ramus occipitalis arteriæ auricularis posterioris

Rectus capitis posticus major muscle—M. rectus capitis posterior major

Auricular branches of the posterior auricular artery[3] (1)

Muscular branch of the vertebral artery—Ramus muscularis arteriæ vertebralis

Vertebral artery A. vertebralis

Complexus, or semispinalis capitis, muscle

***Deep branch of the ascending cervical artery**[4]—*Ramus profundus arteriæ cervicalis ascendentis

Semispinalis colli muscle M. semispinalis cervicis

Deep cervical artery A. cervicalis profunda

Semispinalis colli muscle M. semispinalis cervicis

Posterior or dorsal branch of the superior intercostal artery (2)

Scalenus posticus muscle M. scalenus posterior

***Ascending branch**[5] *Ramus ascendens } **of the transverse cervical artery** arteriæ transversæ colli

***Descending branch**[6] *Ramus descendens }

1/2

Longissimus dorsi muscle

Cervicalis ascendens muscle M. iliocostalis cervicis

(1) Rami auriculares arteriæ auricularis posterioris

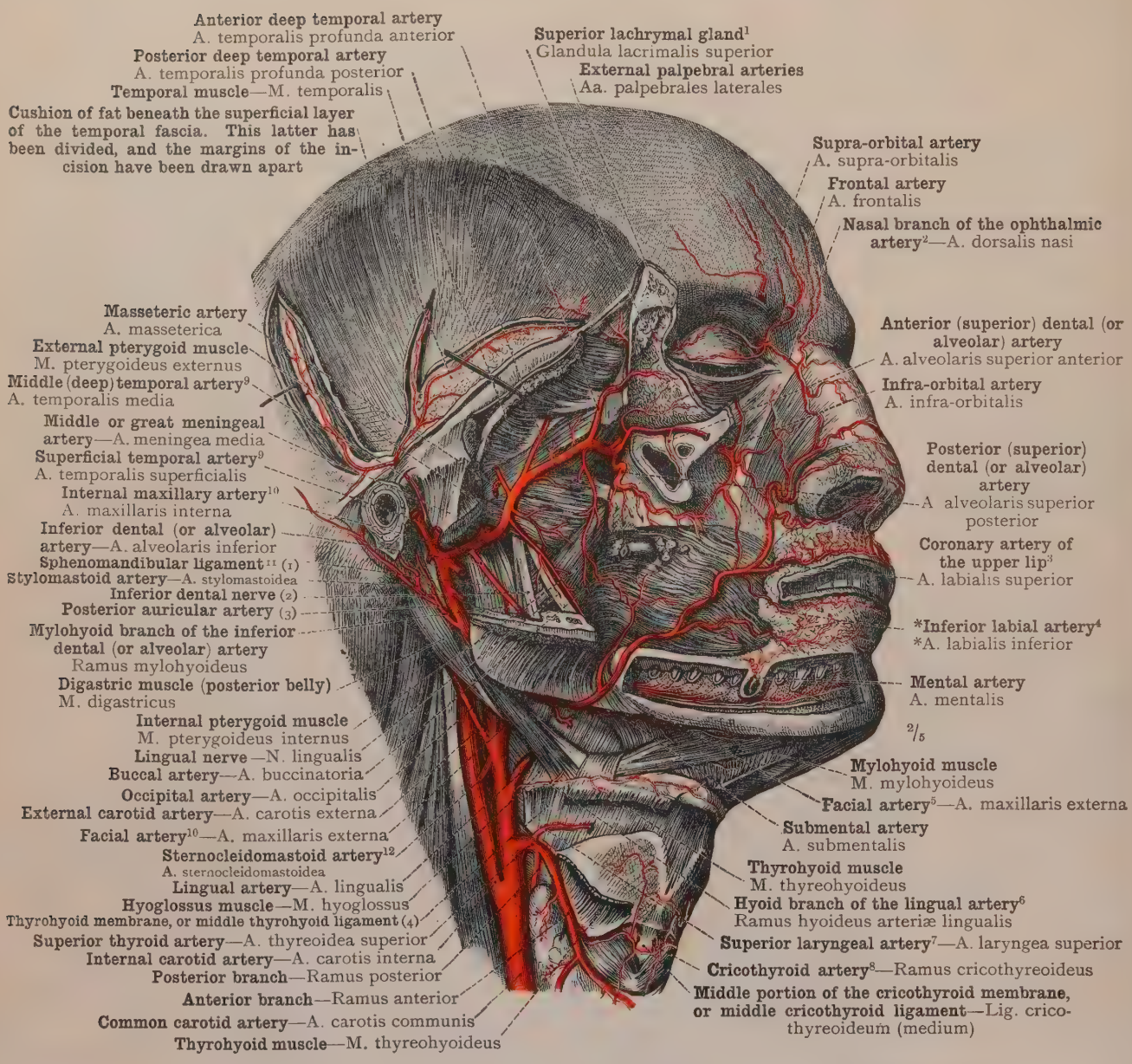
(2) Ramus dorsalis arteriæ intercostalis supremæ

1 Called by Macalister the *external* and *internal terminal branches* of the *occipital artery*.
2 Called by Macalister the *posterior terminal branch* of the *posterior auricular artery*.
3 The branch of the *posterior auricular artery* from which these offsets are derived is called by Macalister the *anterior terminal branch*.
4 See Appendix, note [178].
5 Called by Macalister the *cervical branch* of the *transverse cervical* or *posterior scapular artery*. See Appendix, note [172].
6 The *posterior scapular artery* of English anatomists. See Appendix, note [172].
7 *Transverse cervical* or *posterior scapular artery*, according to Macalister. See Appendix, note [172].
8 Or *ramus cervicalis princeps arteriæ occipitalis*.
9 See Appendix, note [176].

FIG. 1003.—THE ARTERIES OF THE OCCIPITAL REGION, AND THE DEEPEST ARTERIES OF THE NUCHAL REGION. ON THE LEFT SIDE, THE COMPLEXUS OR SEMISPINALIS CAPITIS MUSCLE IS SUPPLIED BY THE DEEP CERVICAL ARTERY; ON THE RIGHT SIDE, HOWEVER, THIS MUSCLE IS FURNISHED WITH BLOOD BY A LARGE MUSCULAR ARTERY; ON THE RIGHT SIDE, HOWEVER, THIS MUSCLE IS FURNISHED WITH BLOOD BY THE DEEP BRANCH, RAMUS PROFUNDUS (*see* OFFSET OF THE ASCENDING CERVICAL ARTERY, KNOWN AS THE *Appendix, note* [178]). THE RIGHT TRANSVERSE CERVICAL ARTERY (*see note* [7] *above*) PERFORATES THE SCALENUS POSTICUS MUSCLE: THIS IS A FREQUENT VARIETY.

In the preparation shown in Fig. 1002, the complexus or semispinalis capitis muscle was separated on each side from its attachment to the skull, and turned outwards. On the right side, the semispinalis colli was cut across a little above the middle of its vertical extent, and the lower segment was drawn outwards, in order to display the passage of the deep cervical artery between the transverse processes of the seventh cervical and first dorsal vertebræ. On the left side, the rectus capitis posticus major, rectus capitis posticus minor, obliquus capitis superior, and obliquus capitis inferior muscles have been removed, and the vertebral artery has thus been fully exposed both above and below the atlas.

Arteriæ cervicalis profunda, vertebralis et occipitalis—The deep cervical, vertebral, and occipital arteries.



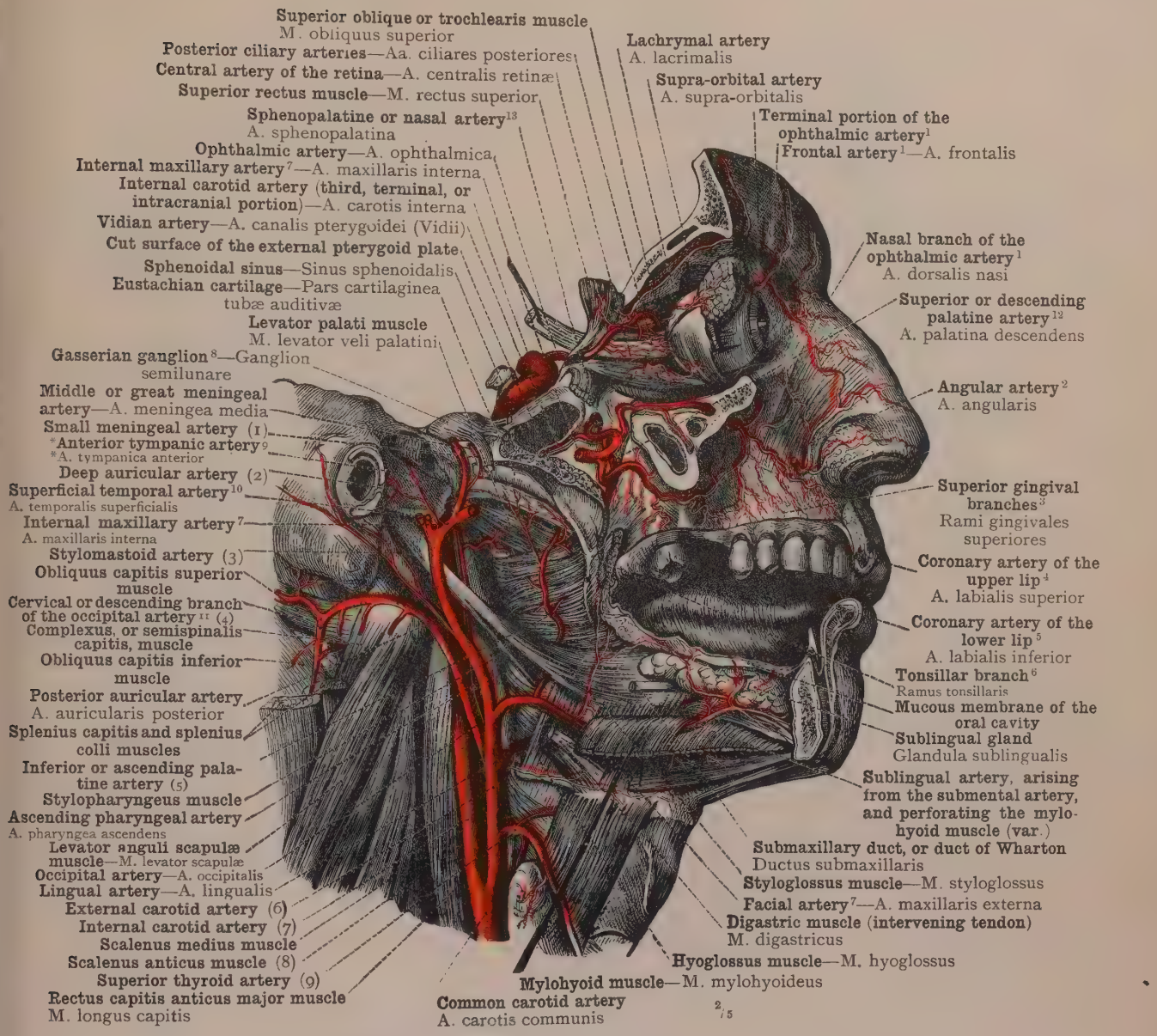
(1) Lig. sphenomandibulare (2) N. alveolaris inferior (3) A. auricularis posterior (4) Membrana hyothyreoidea

[1] See Appendix, note 179. [2] See Appendix, note 164. 3 Called by Macalister the *superior coronary artery*.
4 See Appendix, note 180. 5 See Appendix, note 166. 6 Called by Macalister the *suprahyoidean artery*.
7 Or *laryngeal branch* of the *superior thyroid artery*.
8 Called by Macalister the *inferior laryngeal branch* of the superior thyroid artery. This artery is endangered in the operation of laryngotomy.—Tr.
9 See Appendix, note 168. 10 See Appendix, note 166.
11 Or *internal lateral ligament* of the temporomaxillary articulation. 12 See Appendix, note 169.

FIG. 1004.—THE ARTERIES OF THE UPPER PART OF THE FRONT OF THE NECK, OF THE RETROMANDIBULAR FOSSA (FOSSA RETROMANDIBULARIS), AND OF THE ZYGOMATIC FOSSA (FOSSA INFRATEMPORALIS); SEEN FROM THE RIGHT SIDE.

In the preparation shown in Fig. 999, the pinna or auricle was cut away, and the superficial temporal artery was removed above the point at which the middle (deep) temporal branch (arteria temporalis media) is given off. The zygomatic arch was removed, together with the greater part of the masseter muscle, and the ramus of the mandible was cut away from the neck to below the middle of its vertical extent, the sphenomandibular ligament or internal lateral ligament of the temporomaxillary articulation, however, being left intact. The anterior portion of the outer wall of the orbit was removed, the orbital periosteum being preserved; the upper segment of the temporal muscle was drawn upwards; and the superficial layer of the temporal fascia having been incised and the margins of the incision having been drawn apart, the cushion of fat beneath this superficial layer, and the anterior division of the middle (deep) temporal artery, were exposed; the posterior division of this artery was exposed by an incision through the temporal fascia and the temporal muscle. The thyrohyoid muscle was for the most part removed, in order to lay bare the superior laryngeal artery perforating the thyrohyoid membrane or middle thyrohyoid ligament.

Arteria maxillaris interna—The internal maxillary artery.



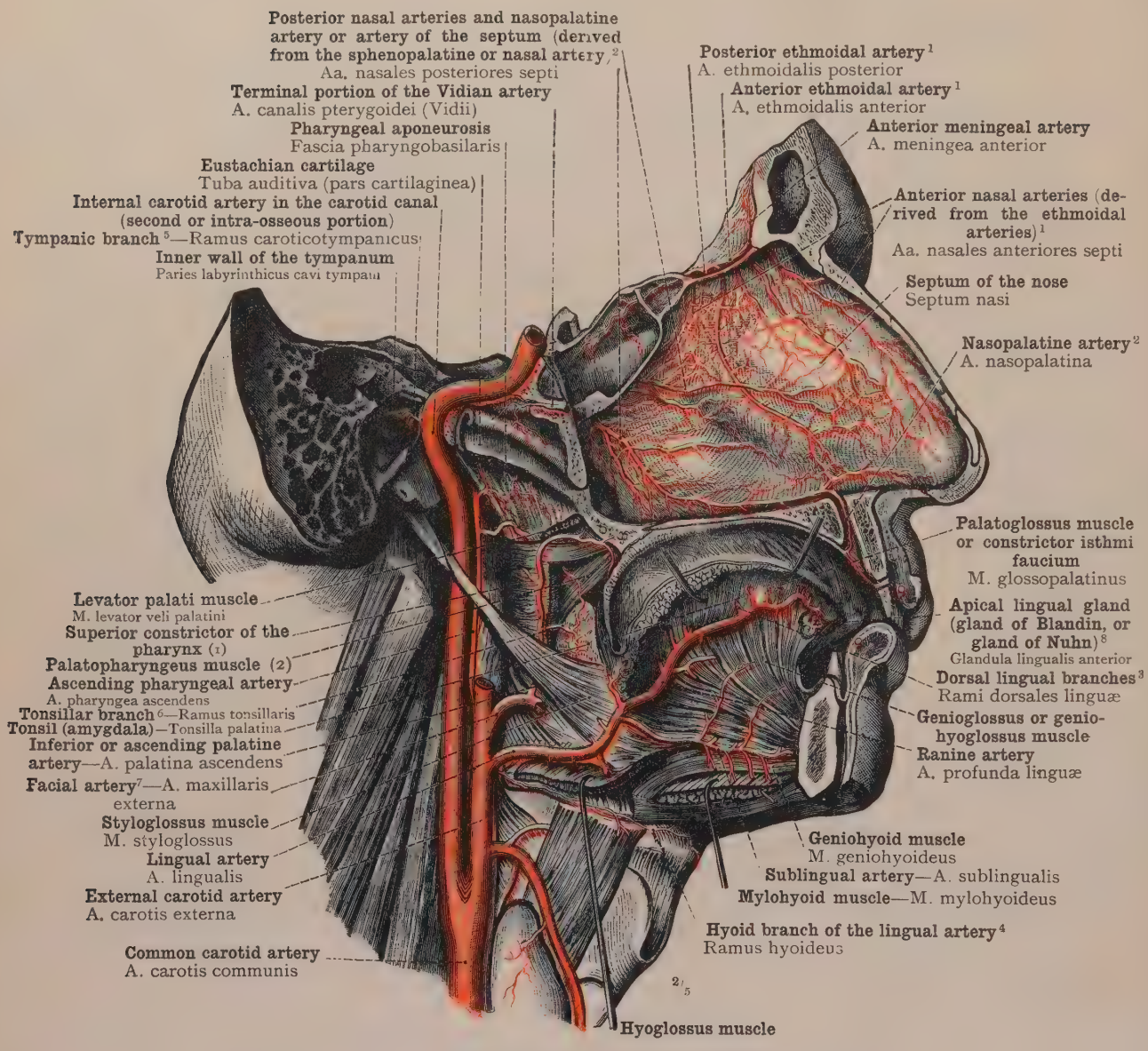
(1) Ramus meningeus accessorius
(2) A. auricularis profunda
(3) A. stylomastoidea
(4) Ramus descendens
(5) A. palatina ascendens
(6) A. carotis externa
(7) A. carotis interna
(8) M. scalenus anterior
(9) A. thyreoidea superior

1 See Appendix, note 164.
2 See Appendix, note 165.
3 See Appendix, note 181.
4 Called by Macalister the *superior coronary artery*.
5 Called by Macalister the *inferior coronary artery*.
6 See Appendix, note 182.
7 See Appendix, note 166.
8 Or *ganglion of the fifth cranial* (*trifacial* or *trigeminal*) *nerve*.
9 See Appendix, note 183.
10 See Appendix, note 168.
11 Called also *princeps cervicis artery*, or *ramus cervicalis princeps arteriæ occipitalis*.
12 See Appendix, note 188.
13 See Appendix, note 185.

FIG. 1005.—THE ARTERIES OF THE ORBIT, THE TERMINAL BRANCHES OF THE INTERNAL MAXILLARY ARTERY, THE ARTERIES OF THE PHARYNX, AND THE ARTERIES OF THE SUBLINGUAL REGION; SEEN FROM THE RIGHT SIDE.

In the preparation shown in Fig. 1004, the right half of the mandible was removed as far forward as the attachment of the digastric muscle, together with the external and internal pterygoid muscles and the second (middle) part of the internal maxillary artery, and by turning down the mylohyoid muscle the sublingual gland was exposed. By a sagittal section, which opened the infra-orbital canal, the outer half of the orbit was removed, the contents of the cavity, however, being preserved. By a section which opened the anterior part of the Vidian or pterygoid canal, the right sphenoidal sinus, the foramen rotundum, the foramen ovale, and the foramen spinosum, the greater part of the floor of the middle cranial fossa was removed, and, after the external pterygoid plate with the circumflexus or tensor palati muscle had been cut away, the origin of the branches of the third (terminal) part of the internal maxillary artery in the sphenomaxillary fossa was displayed.

A. maxillaris interna, the internal maxillary artery; **a. ophthalmica**, the ophthalmic artery; **a. pharyngea ascendens**, the ascending pharyngeal artery; **a. palatina ascendens**, the inferior or ascending palatine artery; **a. sublingualis**, the sublingual artery.



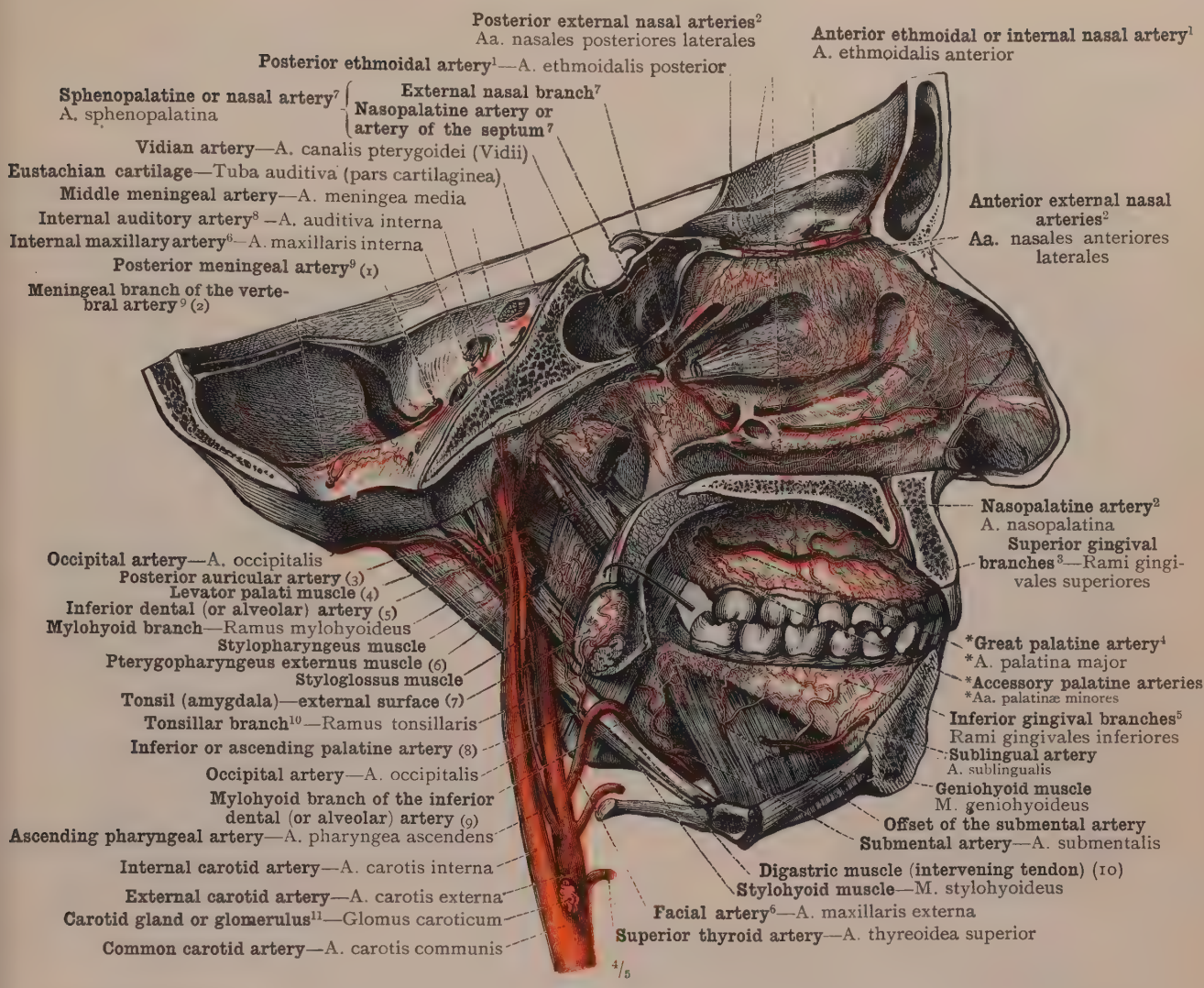
(1) M. constrictor pharyngis superior (2) M. pharyngopalatinus

1 See Appendix, note 184. 2 See Appendix, note 185. 3 See Appendix, note 186.
4 Called by Macalister the *suprahyoidean artery*. 5 See Appendix, note 187.
6 See Appendix, note 182. 7 See Appendix, note 166. 8 See note 2 to p. 420 in Part IV.

FIG. 1006.—ARTERIES OF THE NASAL SEPTUM, THE TONGUE, AND THE PHARYNX; SEEN FROM THE RIGHT SIDE.

In the preparation shown in Fig. 1005, by a sagittal section passing a little to the right of the median plane, the right side of the septum of the nose was exposed; by a section somewhat further to the right, the lower part of the internal pterygoid plate was removed, and the Vidian or pterygoid canal was opened up to its posterior orifice. By means of a section passing through the temporal bone itself, the direction of which was nearly that of the axis of the petrous portion of the temporal bone, the middle ear was opened, and also the carotid canal, by the removal of its outer wall. The posterior extremity of the Eustachian cartilage was cut away, the levator palati muscle was removed just above the point at which it enters the soft palate, and the pharyngeal aponeurosis was laid bare down to the upper border of the superior constrictor of the pharynx. By the removal of the anterior portion of this muscle, the outer surface of the tonsil (amygdala) was exposed. By the partial removal of the hyoglossus muscle and by drawing its lower segment downwards, the lingual artery was laid bare; and by the partial removal of the intrinsic muscular substance of the tongue, the ranine artery was brought into view.

Arteries of the septum of the nose. A. lingualis, the lingual artery. Aa. pharyngea et palatina ascendens, the ascending pharyngeal and ascending palatine arteries. A. carotis interna, the internal carotid artery.


Posterior external nasal arteries[2]
Aa. nasales posteriores laterales
Anterior ethmoidal or internal nasal artery[1]
A. ethmoidalis anterior
Posterior ethmoidal artery[1]—A. ethmoidalis posterior
Sphenopalatine or nasal artery[7]
A. sphenopalatina
External nasal branch[7]
Nasopalatine artery or artery of the septum[7]
Vidian artery—A. canalis pterygoidei (Vidii)
Eustachian cartilage—Tuba auditiva (pars cartilaginea)
Middle meningeal artery—A. meningea media
Internal auditory artery[8]—A. auditiva interna
Internal maxillary artery[6]—A. maxillaris interna
Posterior meningeal artery[9] (1)
Meningeal branch of the vertebral artery[9] (2)
Anterior external nasal arteries[2]
Aa. nasales anteriores laterales
Nasopalatine artery[2]
A. nasopalatina
Superior gingival branches[3]—Rami gingivales superiores
Occipital artery—A. occipitalis
Posterior auricular artery (3)
Levator palati muscle (4)
Inferior dental (or alveolar) artery (5)
Mylohyoid branch—Ramus mylohyoideus
Stylopharyngeus muscle
Pterygopharyngeus externus muscle (6)
Styloglossus muscle
Tonsil (amygdala)—external surface (7)
Tonsillar branch[10]—Ramus tonsillaris
Inferior or ascending palatine artery (8)
Occipital artery—A. occipitalis
Mylohyoid branch of the inferior dental (or alveolar) artery (9)
Ascending pharyngeal artery—A. pharyngea ascendens
Internal carotid artery—A. carotis interna
External carotid artery—A. carotis externa
Carotid gland or glomerulus[11]—Glomus caroticum
Common carotid artery—A. carotis communis
*Great palatine artery[4]
*A. palatina major
*Accessory palatine arteries[4]
*Aa. palatinæ minores
Inferior gingival branches[5]
Rami gingivales inferiores
Sublingual artery
A. sublingualis
Geniohyoid muscle
M. geniohyoideus
Offset of the submental artery
Submental artery—A. submentalis
Digastric muscle (intervening tendon) (10)
Stylohyoid muscle—M. stylohyoideus
Facial artery[6]—A. maxillaris externa
Superior thyroid artery—A. thyreoidea superior
4/5

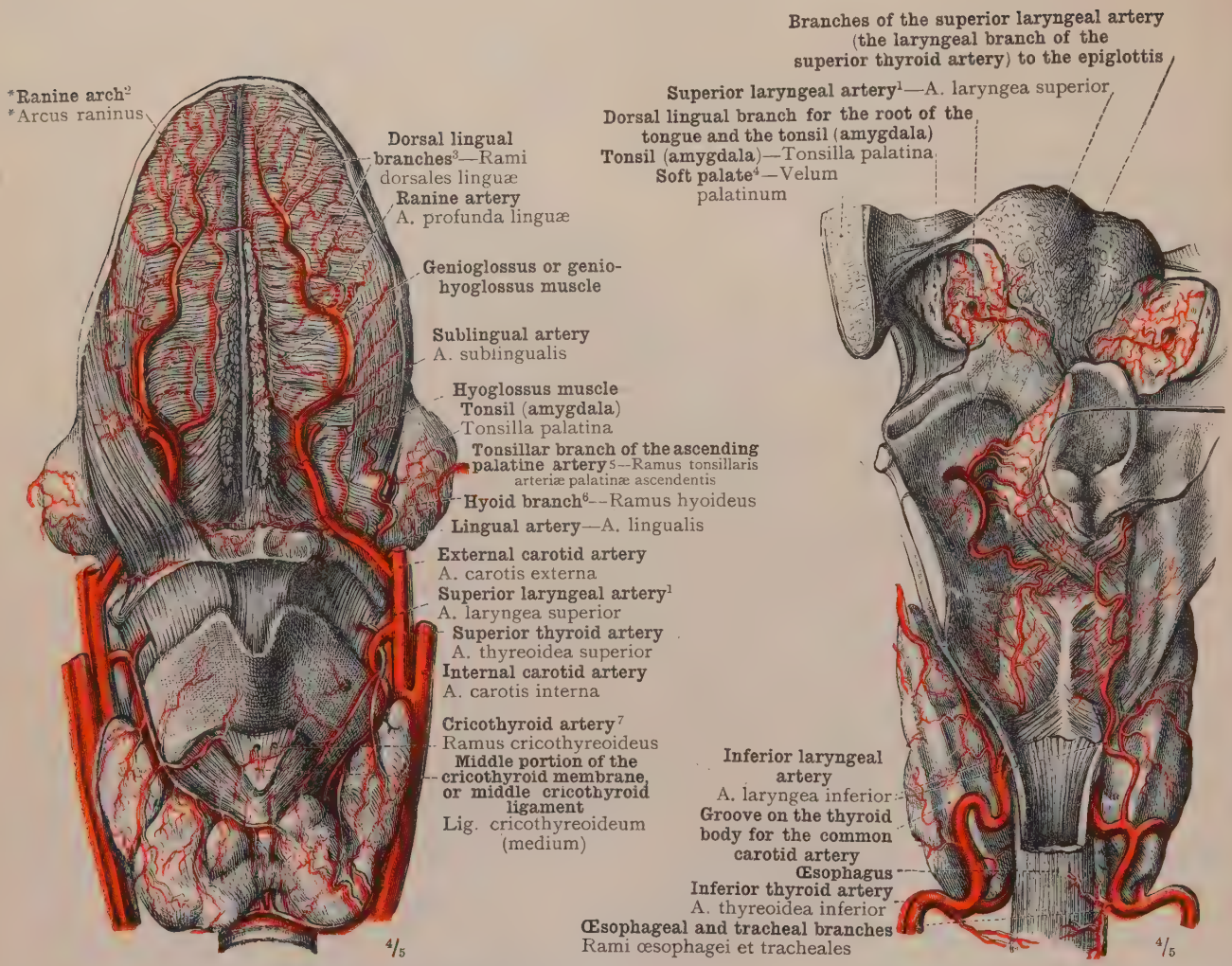
(1) A. meningea posterior (2) Ramus meningeus arteriæ vertebralis (3) A. auricularis posterior (4) M. levator veli palatini
(5) A. alveolaris inferior (6) M. pterygopharyngeus (7) Tonsilla palatina—facies lateralis (8) A. palatina ascendens
(9) Ramus mylohyoideus arteriæ alveolaris inferioris (10) M. digastricus

1 See Appendix, note 184. 2 See Appendix, note 185. 3 See Appendix, note 181. 4 See Appendix, note 188.
5 See Appendix, note 189. 6 See Appendix, note 166. 7 See Appendix, note 185.
8 Called by Quain the *auditory artery* without qualification. 9 See Appendix, note 190. 10 See Appendix, note 182.
11 Called by Macalister the *intercarotic* body, and regarded by him as "the remains of a vascular rete, probably that of the second visceral cleft." Known also as *glandula intercarvtica*, but the term "gland" is a misnomer.—TR.

FIG. 1007.—THE ARTERIES OF THE EXTERNAL WALL OF THE NASAL FOSSÆ, OF THE CARTILAGINOUS PORTION OF THE EUSTACHIAN TUBE, OF THE HARD PALATE, OF THE TONSIL (AMYGDALA), AND OF THE EXTERNAL WALL OF THE MOUTH; THE SMALLER MENINGEAL ARTERIES; THE INTERNAL CAROTID ARTERY, THE EXTERNAL CAROTID ARTERY AND ITS BRANCHES. LEFT HALF OF THE HEAD SEEN FROM THE INNER SIDE.

By a sagittal section passing a little to the left of the median plane, the right half of the head was removed, the spinal column having first been cut away. After the pharynx had been removed, the left external and internal carotid arteries, as well as the branches of the former artery, were exposed from within. The left half of the soft palate and the left tonsil (amygdala) were retained, the latter being drawn a little forward, in order to display the ramification on its surface of the offsets of the tonsillar branch of the ascending palatine artery. Behind the levator palati muscle, a narrow strip of the pterygopharyngeus externus muscle was preserved. The posterior extremity of the middle turbinate bone was removed, in order to expose the lower posterior external nasal branch of the sphenopalatine or nasal artery. In the oral cavity, the tongue and the sublingual gland were removed, the mylohyoid and geniohyoid muscles as well as the anterior portion of the sublingual artery being preserved, and the inferior gingival branches were exposed, springing from the sublingual artery, from a perforating offset of the submental artery, and from the mylohyoid branch of the inferior dental (or alveolar) artery.

Arteries of the external wall of the nasal fossæ: A. pterygopalatina, the superior or descending palatine artery. A. canalis pterygoidei, the Vidian artery. Aa. pharyngea et palatina ascendens, the ascending pharyngeal and the inferior or ascending palatine artery.



[1] Or *laryngeal branch* of the *superior thyroid artery*.
[2] See Appendix, note [191].
[3] See Appendix, note [185].
[4] Or *velum pendulum palati*.
[5] See Appendix, note [182].
[6] The *hyoid branch* of the *lingual artery* is called by Macalister the *suprahyoidean artery*.
[7] Called by Macalister the *inferior laryngeal branch* of the *superior thyroid artery*. This vessel is endangered in the operation of laryngotomy.—Tr.

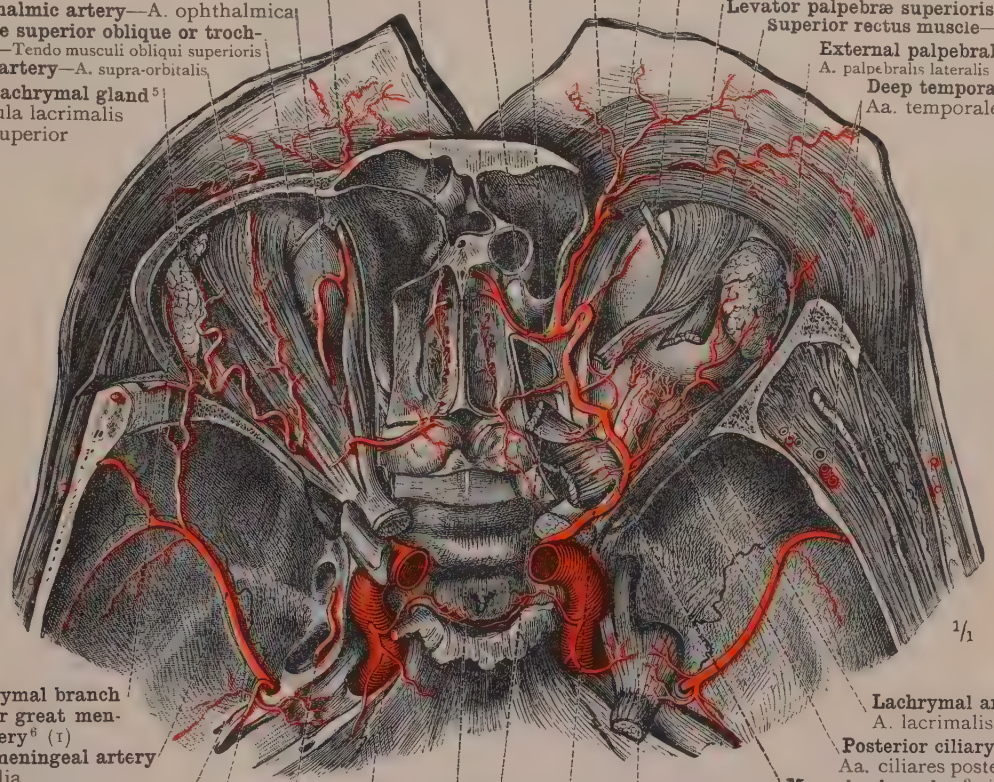
FIG. 1008.—THE TONGUE, THE LARYNX, AND THE THYROID BODY, SEEN FROM THE VENTRAL SIDE. THE RAMIFICATION OF THE RANINE ARTERY, ARTERIA PROFUNDA LINGUÆ, AND THE TRANSVERSE ANASTOMOSIS BETWEEN THE TWO RANINE ARTERIES, KNOWN AS THE *RANINE ARCH, *ARCUS RANINUS (*see Appendix, note* [191]); THE LINGUAL ARTERY, ARTERIA LINGUALIS, WITH ITS HYOID BRANCH, RAMUS HYOIDEUS (*see note* [6] *above*); THE ARTERIES OF THE TONSIL (AMYGDALA), TONSILLA PALATINA; THE SUPERIOR THYROID ARTERY, ARTERIA THYROIDEA SUPERIOR, WITH THE SUPERIOR LARYNGEAL ARTERY, ARTERIA LARYNGEA SUPERIOR (*see note* [1] *above*), AND THE CRICOTHYROID ARTERY, RAMUS CRICOTHYROIDEUS (*see note* [7] *above*).

In the right half of the tongue the hyoglossus muscle has been preserved; in the left half it has been removed, and the left lingual artery has thus been fully exposed. The sublingual artery, arteria sublingualis, has been cut away on both sides close to its origin; the dorsal lingual branches have been traced for a considerable distance by the partial removal of the intrinsic muscular substance of the tongue.

FIG. 1009.—THE ROOT OF THE TONGUE, THE LARYNX, AND THE LARYNGEAL PORTION OF THE PHARYNX, WITH THE ADJOINING PORTION OF THE ŒSOPHAGUS AND THE THYROID BODY; SEEN FROM THE DORSAL SIDE.

After the posterior wall of the pharynx had been removed, the mucous membrane covering the left pyriform sinus and the anterior wall of the pharynx as far down as the commencement of the œsophagus was dissected off, and the superior and inferior laryngeal arteries were exposed. The epiglottis was drawn to the right, in order to display the offsets with which it is supplied by the superior laryngeal artery. On both sides the mucous membrane of the root of the tongue and of the tonsils was partially removed, in order to expose the site of emergence on the dorsum of the muscular substance of the tongue of the hindmost dorsal lingual branch, and the superficial ramification of that artery.

Arteries of the Tongue, the Larynx, the Tonsil (Amygdala), and the Thyroid Body.


Anterior ethmoidal or internal nasal artery[4]
A. ethmoidalis anterior
Posterior ethmoidal artery[4]—A. ethmoidalis posterior
Anterior meningeal artery—A. meningea anterior
Frontal artery[1]—A. frontalis
Ophthalmic artery—A. ophthalmica
Tendon of the superior oblique or trochlearis muscle—Tendo musculi obliqui superioris
Supra-orbital artery—A. supra-orbitalis
Superior lachrymal gland[5]
Glandula lacrimalis superior
Frontal artery[1]—A. frontalis
Nasal branch of the ophthalmic artery[1]
A. dorsalis nasi
Tendon of the superior oblique or trochlearis muscle—Tendo musculi obliqui superioris
Levator palpebræ superioris muscle
Superior rectus muscle—M. rectus superior
External palpebral artery
A. palpebralis lateralis
Deep temporal arteries
Aa. temporales profundæ
1/1
Orbital or lachrymal branch of the middle or great meningeal artery[6] (1)
Middle or great meningeal artery
A. meningea media
Superior tympanic artery[7]
A. tympanica superior
Petrosal or Fallopian branch[8] (2)
Small meningeal artery
Ramus meningeus accessorius
Internal carotid artery
A. carotis interna
Lachrymal artery
A. lacrimalis
Posterior ciliary arteries
Aa. ciliares posteriores
Muscular branches[2]
Rami musculares
Gasserian ganglion[3]—Ganglion semilunare (Gasseri)
Ophthalmic artery—A. ophthalmica
Superior oblique or trochlearis muscle—M. obliquus superior
Pituitary body, or hypophysis cerebri
Hypophysis

(1) Ramus orbitalis (var.)

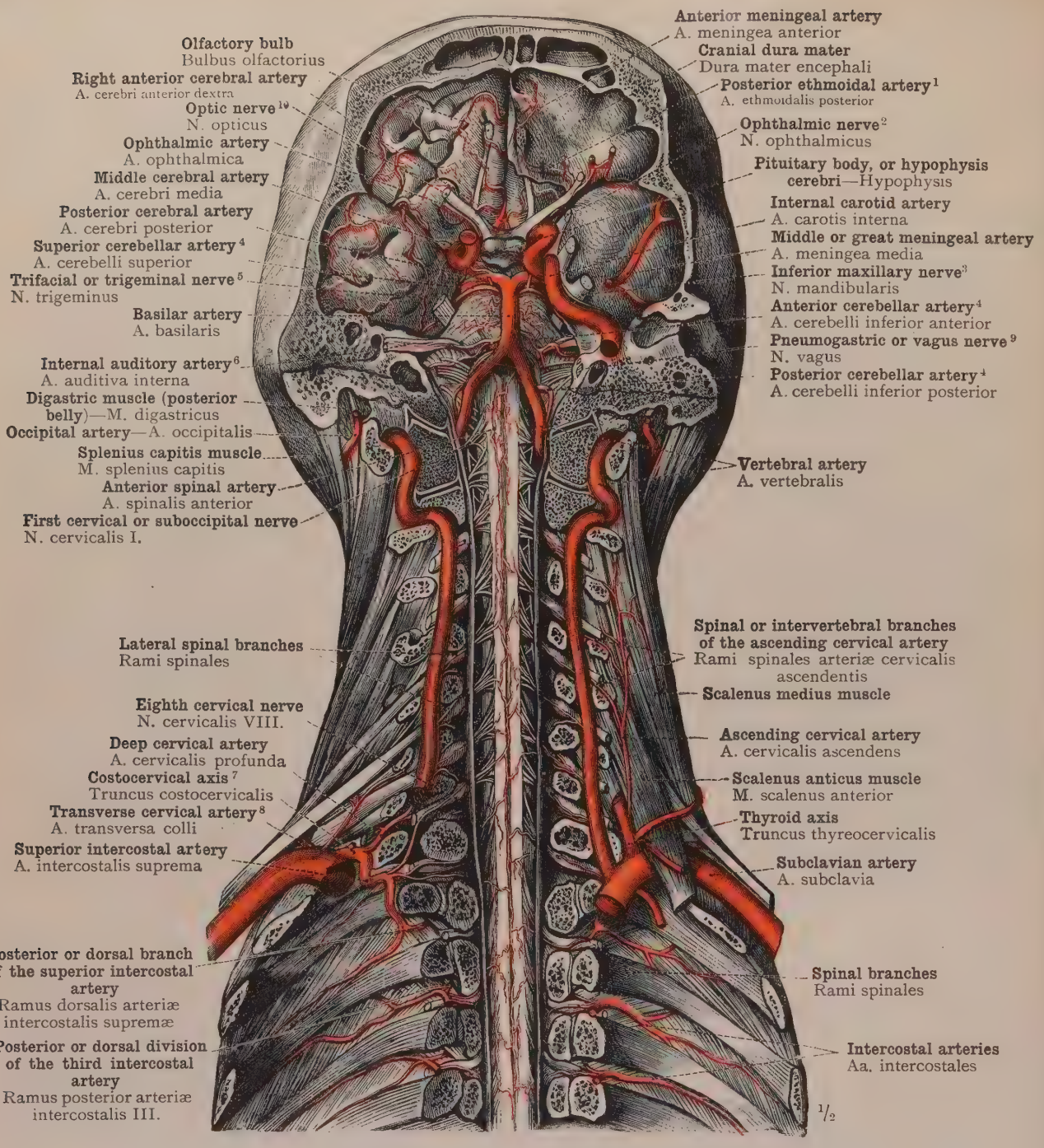
(2) Ramus petrosus superficialis

1 See Appendix, note 164.
2 See Appendix, note 192.
3 Or *ganglion of the fifth cranial* (*trifacial* or *trigeminal*) *nerve*.
4 See Appendix, note 184.
5 See Appendix, note 179.
6 See Appendix, note 193.
7 See Appendix, note 194.
8 See Appendix, note 183.

FIG. 1010.—THE THIRD, TERMINAL, OR INTRACRANIAL PORTION OF THE INTERNAL CAROTID ARTERY, ARTERIA CAROTIS INTERNA, AND THE DISTRIBUTION OF THE OPHTHALMIC ARTERY, ARTERIA OPHTHALMICA; SEEN FROM ABOVE. THE MIDDLE MENINGEAL ARTERY SENDS AN OFFSET TO THE LACHRYMAL GLAND THROUGH THE OUTER WALL OF THE ORBIT (A COMMON VARIETY—*see Appendix, note* 193). ON THE LEFT SIDE, THE POSTERIOR ETHMOIDAL ARTERY IS LARGER THAN THE ANTERIOR ETHMOIDAL, AND CROSSES ABOVE (INSTEAD OF BELOW) THE SUPERIOR OBLIQUE OR TROCHLEARIS MUSCLE (VAR.).

The roof of the right orbit, and the roof and the upper part of the outer wall of the left orbit, were removed. The scalp having been separated from the subjacent squamous portion of the frontal bone and turned forwards and a little downwards, the branches of the ophthalmic artery, arteria ophthalmica, emerging from beneath the orbital arch or supra-orbital margin, margo supra-orbitalis, were exposed: these branches are, the supra-orbital artery, arteria supra-orbitalis; the frontal artery, arteria frontalis; and the nasal branch, arteria dorsalis nasi (*see Appendix, note* 164). On the right side, the levator palpebræ superioris muscle, the superior rectus muscle, and the superior oblique or trochlearis muscle were in part removed, and their proximal segments were turned backwards, in order to expose the entire course of the ophthalmic artery, arteria ophthalmica, its offsets to the orbital muscles, rami musculares (*see Appendix, note* 192), and to the eyeball, and the origin of the ethmoidal arteries (*see Appendix, note* 184). The right anterior ethmoidal or internal nasal artery was laid bare from its origin up to its point of emergence from the cranial cavity; by the partial removal of the roof of the sphenoidal sinus, its mucoperiosteum being left intact, the ramification in the substance of this membrane of the branches of the posterior ethmoidal artery was displayed.

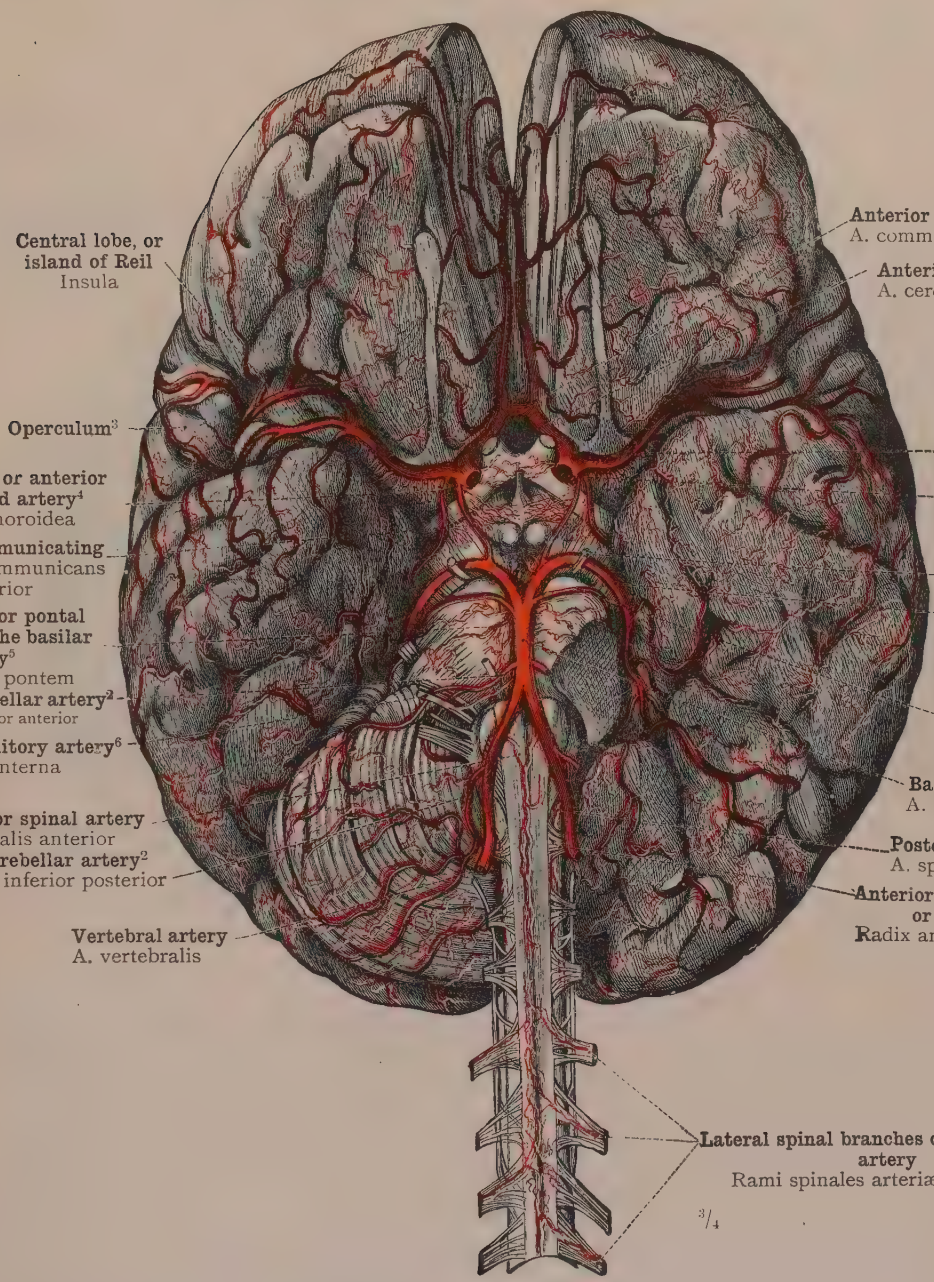
Arteries of the Orbit, and of the Anterior and Middle Cranial Fossæ.



[1] See Appendix, note [134]. [2] Or *first division* of the *fifth cranial* (*trifacial* or *trigeminal*) *nerve*.
[3] Or *third division* of the *fifth cranial* (*trifacial* or *trigeminal*) *nerve*. [4] See Appendix, note [195]. [5] Or *fifth cranial nerve*.
[6] Called by Quain the *auditory artery* without qualification. [7] See Appendix, note [177].
[8] Or *posterior scapular artery* (Macalister); and see Appendix, note [172].
[9] Or *tenth cranial nerve*, according to Soemerring's enumeration. (According to that of Willis, the *par vagum* of the eighth cranial nerve.)—Tr.
[10] Or *second cranial nerve*.

FIG. 1011.—IN THE THORAX, THE BODIES OF THE VERTEBRÆ WITH THE HEADS OF THE RIBS HAVE BEEN REMOVED; IN THE NECK, THE BODIES OF THE VERTEBRÆ AND THE ANTERIOR LIMBS OF THE TRANSVERSE PROCESSES (*i.e.*, THE COSTAL PROCESSES), SO AS TO EXPOSE THE VERTEBRAL ARTERY, AND, AFTER CUTTING AWAY THE ANTERIOR PORTION OF THE SPINAL DURA MATER, THE SPINAL BRANCHES OF THE VERTEBRAL ARTERY AND THE SPINAL OR INTERVERTEBRAL BRANCHES OF THE ASCENDING CERVICAL ARTERY. IN THE HEAD, THE GREATER PART OF THE BASE OF THE SKULL HAS BEEN CUT AWAY, AND ON THE RIGHT SIDE THE EXPOSED PORTION OF THE CRANIAL DURA MATER HAS ALSO BEEN REMOVED, SO AS TO LAY BARE THE ARTERIES OF THE BASE OF THE BRAIN. SEEN FROM BEFORE. THE INTERNAL AUDITORY ARTERY, ARTERIA AUDITIVA INTERNA (*see note* [6] *above*), ARISES IN THIS SPECIMEN FROM THE ANTERIOR CEREBELLAR ARTERY, ARTERIA CEREBELLI INFERIOR ANTERIOR (*see Appendix, note* [195]), INSTEAD OF, AS NORMALLY, DIRECTLY FROM THE BASILAR ARTERY. THIS IS A COMMON VARIETY.

A. vertebralis, the vertebral artery. A. basilaris, the basilar artery. A. carotis interna, the internal carotid artery.



1 Or *third cranial nerve.* Sometimes distinguished from the *fourth* and the *sixth cranial nerves* as the *common oculomotor nerve*, and often spoken of as the *motor oculi nerve.*

2 See Appendix note 195.

3 See Appendix, note 196.

4 Distinguished as *anterior choroid artery* from the *posterior choroid branch* of the *posterior cerebral artery*, which is not mentioned by the author.—Tr.

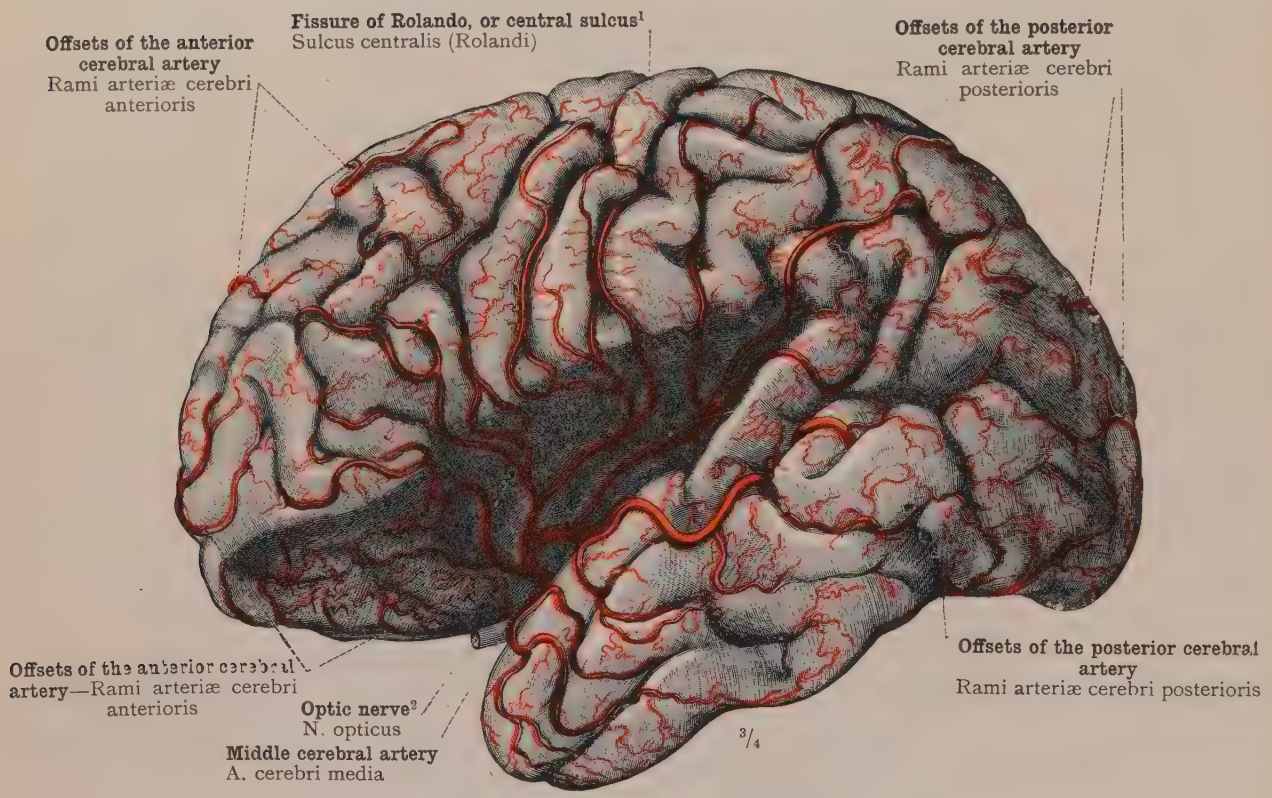
5 Or *transverse arteries of the pons* (Ellis, "Demonstrations of Anatomy").

6 Called by Quain the *auditory artery* without qualification.

FIG. 1012.—THE ARTERIES OF THE BASE OF THE BRAIN; THE CIRCLE OF WILLIS, CIRCULUS ARTERIOSUS (WILLISI).

The frontal lobes were drawn a little apart, in order to display the two anterior cerebral arteries as far as the genu of the corpus callosum; the right fissure of Sylvius, fissura cerebri lateralis dextra, was opened up to some extent, in order to trace the ramification of the middle cerebral artery. After the removal of the left hemisphere of the cerebellum, the ramification of the posterior cerebral artery on the basal (inferior) surface of the temporal and occipital lobes was exposed.

Arteries of the Brain.

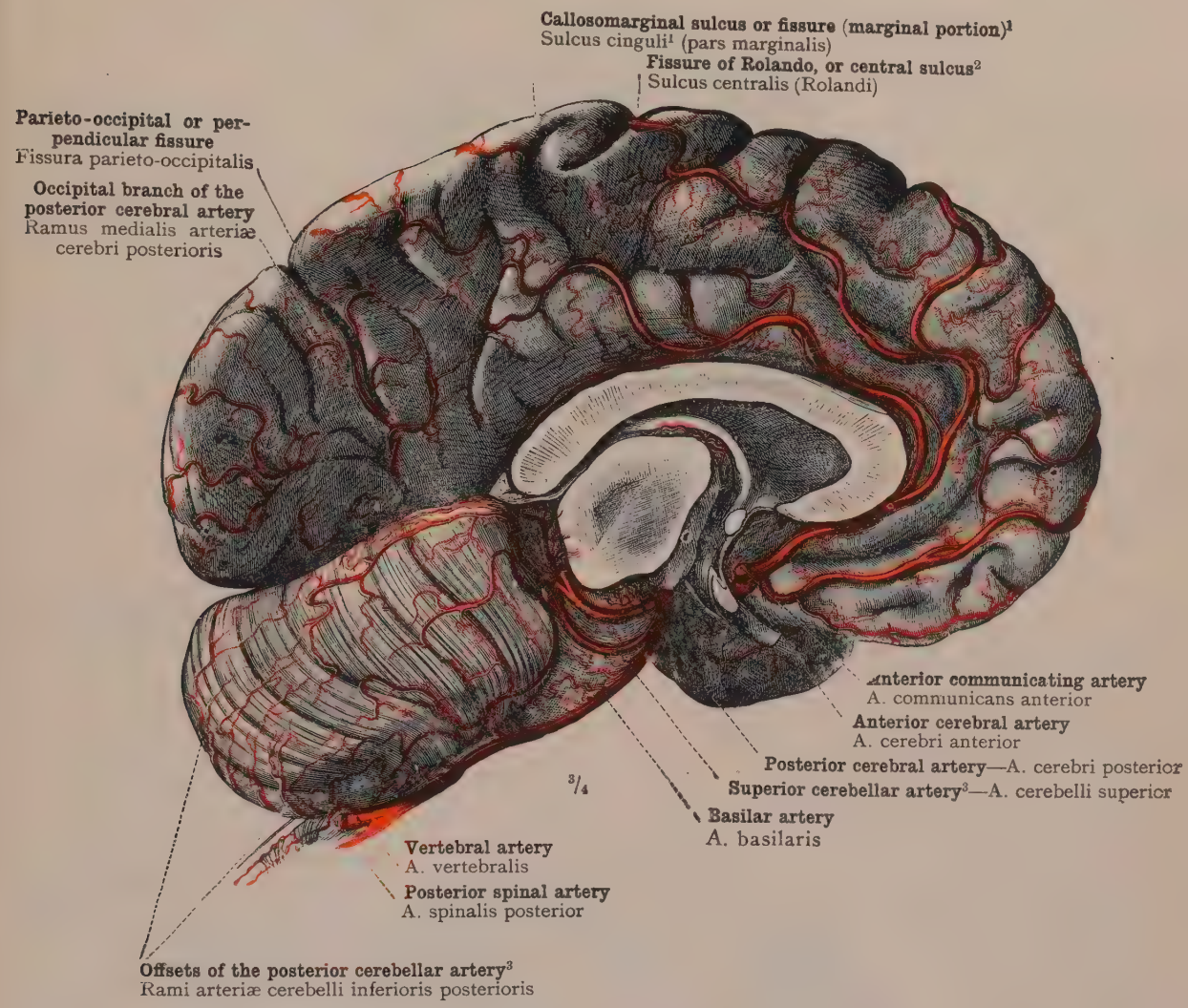

Fissure of Rolando, or central sulcus[1]
Sulcus centralis (Rolandi)
Offsets of the anterior cerebral artery
Rami arteriæ cerebri anterioris
Offsets of the posterior cerebral artery
Rami arteriæ cerebri posterioris
Offsets of the anterior cerebral artery—Rami arteriæ cerebri anterioris
Optic nerve[2]
N. opticus
Middle cerebral artery
A. cerebri media
Offsets of the posterior cerebral artery
Rami arteriæ cerebri posterioris
3/4

[1] *Fissure of Rolando.*—If the use of the term *fissure* be restricted, according to the usage of some authorities, to those sulci that involve the whole thickness both of the grey and the white substance of the cerebrum, and thus affect the form of the lateral ventricle or give rise to eminences projecting on its wall, the *central sulcus* does not come within that category. It is, on the other hand, one of the *primary sulci*, one of those that are already apparent in the sixth month of intra-uterine life; and, moreover, it is an *interlobar sulcus*, constituting the boundary on the outer surface of the hemisphere between the frontal and the parietal lobes. Hence it is usually distinguished by the title of *fissure*, and is seldom spoken of as the *furrow of Rolando*.—Tr.

[2] Or *second cranial nerve*.

FIG. 1013.—THE RAMIFICATION OF THE CEREBRAL ARTERIES, ARTERIÆ CEREBRI, ON THE CONVEX (OUTER) SURFACE OF THE LEFT CEREBRAL HEMISPHERE AND THE CENTRAL LOBE OR ISLAND OF REIL, AND ALSO ON THE BASAL (INFERIOR) SURFACE OF THE FRONTAL LOBE. THE LEFT HEMISPHERE OF THE CEREBRUM, SEEN FROM THE OUTER SIDE.

The fissure of Sylvius fissura cerebri lateralis (Sylvii), was widely opened by the separation of the adjoining lobes of the cerebral hemisphere, in order to display the ramification of the middle cerebral artery, arteria cerebri media, at the bottom of the fissure.



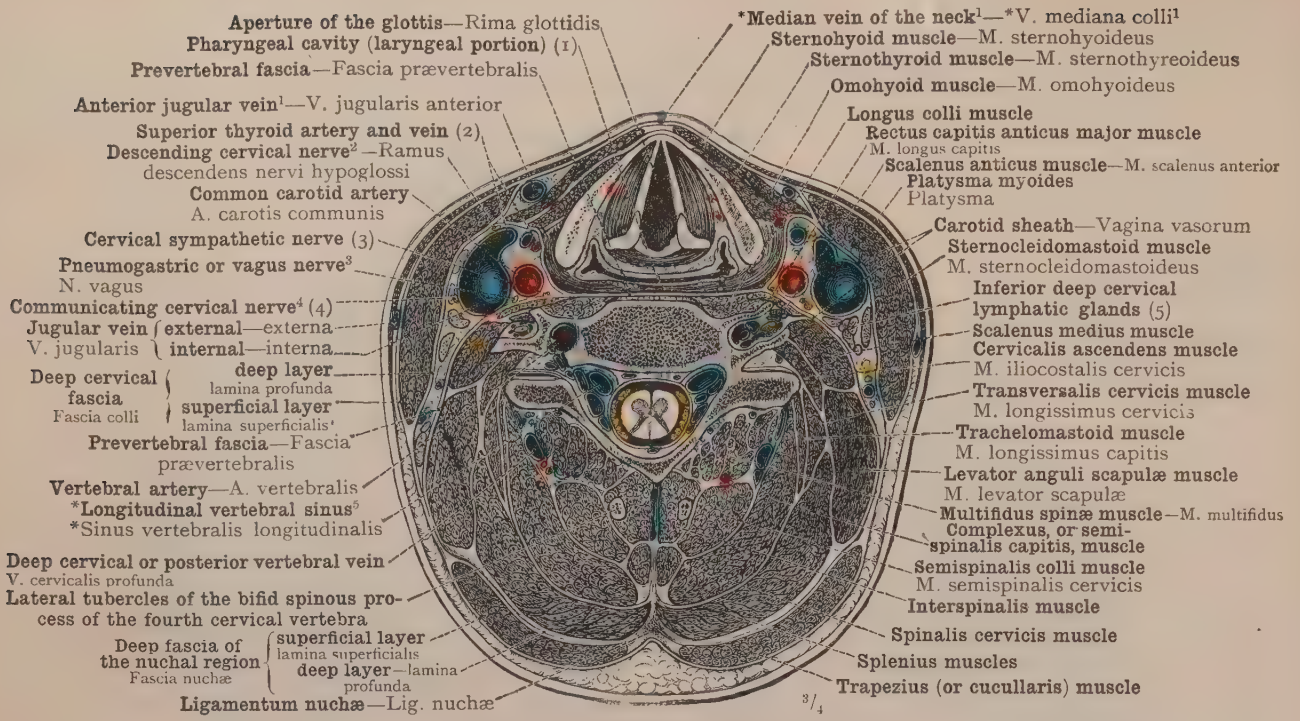
[1] *Sulcus Cinguli.*—This term is not used by English anatomists. The *callosal convolution, gyrus fornicatus,* is in England sometimes termed *gyrus cinguli,* and this latter name is used by the author to distinguish what he calls the "upper portion of the *gyrus fornicatus,*" the convolution on the inner (mesial) surface of the hemisphere immediately above the corpus callosum or great commissure. The *gyrus cinguli* is bounded above by the *sulcus cinguli,* the *callosomarginal sulcus* of English authors; and this is divided by Toldt into a *pars marginalis* and a *pars subfrontalis. marginal* and *subfrontal portions,* the terms being self-explanatory. The posterior portion was called by Wilder the *paracentral fissure ;* the anterior portion, which is parallel with the genu of the corpus callosum, the *prelimbic fissure.*—Tr.

[2] See note [1] to p. 624.

[3] See Appendix, note [195].

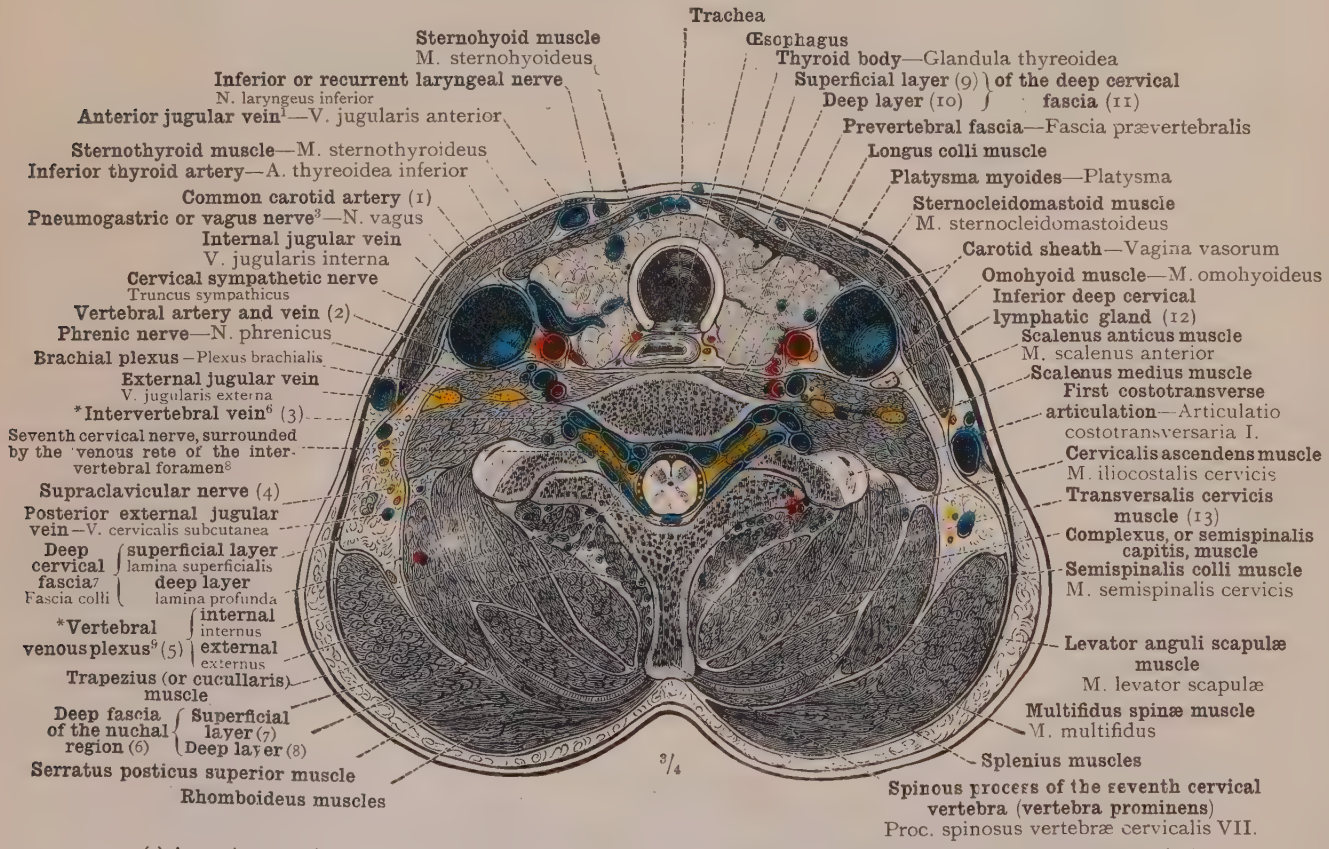
FIG. 1014.—THE DISTRIBUTION OF THE ANTERIOR AND POSTERIOR CEREBRAL ARTERIES, ARTERIÆ CEREBRI ANTERIOR ET POSTERIOR, ON THE INTERNAL (MESIAL) SURFACE OF THE LEFT HEMISPHERE OF THE CEREBRUM; AND ALSO THE RAMIFICATION OF THE SUPERIOR AND POSTERIOR CEREBELLAR ARTERIES, ARTERIÆ CEREBELLI SUPERIOR ET INFERIOR POSTERIOR (*see Appendix, note* [195]), ON THE UPPER SURFACE OF THE RIGHT HEMISPHERE OF THE CEREBELLUM. THE POSTERIOR SPINAL ARTERY, ARTERIA SPINALIS POSTERIOR; THE VERTEBRAL ARTERY, ARTERIA VERTEBRALIS; AND THE BASILAR ARTERY, ARTERIA BASILARIS.

The corpus callosum or great commissure having been divided longitudinally in the median plane, the right hemisphere of the cerebrum was removed by a section passing through its peduncle (the right crus cerebri), in order to display the course and distribution of the anterior and posterior cerebral arteries, arteriæ cerebri anterior et posterior, and also to expose the branches of the posterior cerebral artery that enter the isthmus of the brain as well as those passing to the velum interpositum or tela choroidea superior (tela choroidea ventriculi tertii).


Aperture of the glottis—Rima glottidis
Pharyngeal cavity (laryngeal portion) (1)
Prevertebral fascia—Fascia prævertebralis
Anterior jugular vein[1]—V. jugularis anterior
Superior thyroid artery and vein (2)
Descending cervical nerve[2]—Ramus descendens nervi hypoglossi
Common carotid artery
A. carotis communis
Cervical sympathetic nerve (3)
Pneumogastric or vagus nerve[3]
N. vagus
Communicating cervical nerve[4] (4)
Jugular vein { external—externa / internal—interna
V. jugularis
Deep cervical fascia (Fascia colli) { deep layer—lamina profunda / superficial layer—lamina superficialis
Prevertebral fascia—Fascia prævertebralis
Vertebral artery—A. vertebralis
*Longitudinal vertebral sinus[5]
*Sinus vertebralis longitudinalis
Deep cervical or posterior vertebral vein
V. cervicalis profunda
Lateral tubercles of the bifid spinous process of the fourth cervical vertebra
Deep fascia of the nuchal region (Fascia nuchæ) { superficial layer—lamina superficialis / deep layer—lamina profunda
Ligamentum nuchæ—Lig. nuchæ
*Median vein of the neck[1]—*V. mediana colli[1]
Sternohyoid muscle—M. sternohyoideus
Sternothyroid muscle—M. sternothyreoideus
Omohyoid muscle—M. omohyoideus
Longus colli muscle
Rectus capitis anticus major muscle
M. longus capitis
Scalenus anticus muscle—M. scalenus anterior
Platysma myoides
Platysma
Carotid sheath—Vagina vasorum
Sternocleidomastoid muscle
M. sternocleidomastoideus
Inferior deep cervical lymphatic glands (5)
Scalenus medius muscle
Cervicalis ascendens muscle
M. iliocostalis cervicis
Transversalis cervicis muscle
M. longissimus cervicis
Trachelomastoid muscle
M. longissimus capitis
Levator anguli scapulæ muscle
M. levator scapulæ
Multifidus spinæ muscle—M. multifidus
Complexus, or semi-spinalis capitis, muscle
Semispinalis colli muscle
M. semispinalis cervicis
Interspinalis muscle
Spinalis cervicis muscle
Splenius muscles
Trapezius (or cucullaris) muscle
3/4

(1) Cavum pharyngis (pars laryngea) (2) A. et v. thyreoidea superior (3) Truncus sympathicus (4) N. cervicalis descendens
(5) Lymphoglandulæ cervicales profundæ inferiores

FIG. 1015.—TRANSVERSE SECTION THROUGH THE NECK, AT THE LEVEL OF THE APERTURE OF THE GLOTTIS, AND PASSING THROUGH THE BODY OF THE FIFTH CERVICAL VERTEBRA; UPPER SURFACE OF THE LOWER SEGMENT.


Trachea
Sternohyoid muscle
M. sternohyoideus
Œsophagus
Thyroid body—Glandula thyreoidea
Inferior or recurrent laryngeal nerve
N. laryngeus inferior
Superficial layer (9) } of the deep cervical
Deep layer (10) } fascia (11)
Anterior jugular vein[1]—V. jugularis anterior
Prevertebral fascia—Fascia prævertebralis
Sternothyroid muscle—M. sternothyreoideus
Inferior thyroid artery—A. thyreoidea inferior
Longus colli muscle
Platysma myoides—Platysma
Common carotid artery (1)
Pneumogastric or vagus nerve[3]—N. vagus
Sternocleidomastoid muscle
M. sternocleidomastoideus
Internal jugular vein
V. jugularis interna
Carotid sheath—Vagina vasorum
Cervical sympathetic nerve
Truncus sympathicus
Omohyoid muscle—M. omohyoideus
Vertebral artery and vein (2)
Inferior deep cervical lymphatic gland (12)
Phrenic nerve—N. phrenicus
Scalenus anticus muscle
M. scalenus anterior
Brachial plexus—Plexus brachialis
Scalenus medius muscle
External jugular vein
V. jugularis externa
First costotransverse articulation—Articulatio costotransversaria I.
*Intervertebral vein[6] (3)
Seventh cervical nerve, surrounded by the venous rete of the intervertebral foramen[8]
Cervicalis ascendens muscle
M. iliocostalis cervicis
Supraclavicular nerve (4)
Transversalis cervicis muscle (13)
Posterior external jugular vein—V. cervicalis subcutanea
Complexus, or semispinalis capitis, muscle
Deep cervical fascia[7] (Fascia colli) { superficial layer—lamina superficialis / deep layer—lamina profunda
Semispinalis colli muscle
M. semispinalis cervicis
*Vertebral venous plexus[9] (5) { internal—internus / external—externus
Levator anguli scapulæ muscle
M. levator scapulæ
Trapezius (or cucullaris) muscle
Deep fascia of the nuchal region (6) { Superficial layer (7) / Deep layer (8)
Multifidus spinæ muscle
M. multifidus
Serratus posticus superior muscle
Splenius muscles
Rhomboideus muscles
Spinous process of the seventh cervical vertebra (vertebra prominens)
Proc. spinosus vertebræ cervicalis VII.
3/4

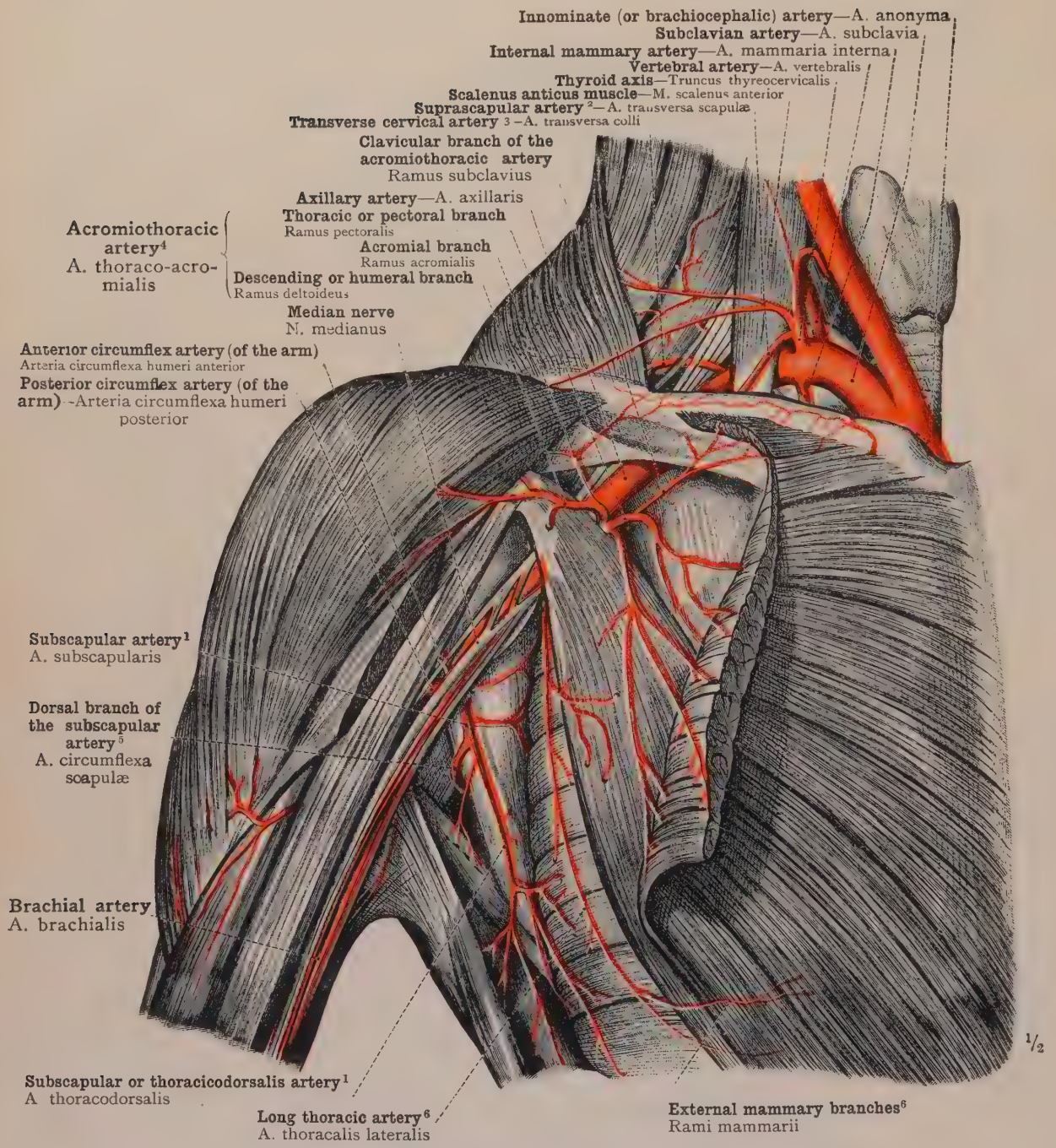
(1) A. carotis communis (2) A. et v. vertebralis (3) *V. intervertebralis (4) N. supraclavicularis (5) Plexus venosus vertebrales
(6) Fascia nuchæ (7) Lamina superficialis (8) Lamina profunda (9) Lamina superficialis (10) Lamina profunda
(11) Fasciæ colli (12) Lymphoglandula cervicalis profunda inferior (13) M. longissimus cervicis

FIG. 1016.—TRANSVERSE SECTION THROUGH THE NECK, PASSING THROUGH THE SPINE NEAR THE LOWER SURFACE OF THE BODY OF THE SEVENTH CERVICAL VERTEBRA (VERTEBRA PROMINENS). UPPER SURFACE OF THE LOWER SEGMENT.

[1] See Appendix, note 197. [2] See Appendix, note 198.
[3] Or *tenth cranial nerve*, according to Soemmerring's enumeration. (According to that of Willis, the *par vagum* of the eighth cranial nerve.)—TR.
[4] See Appendix, note 199. [5] See Appendix, note 200. [6] See Appendix, note 201. [7] See Appendix, note 202.
[8] See note 5 to p. 667. [9] See note 1 to p. 665.

ARTERIÆ EXTREMITATUM SUPERIORUM ET INFERIORUM

THE ARTERIES OF THE UPPER AND LOWER EXTREMITIES

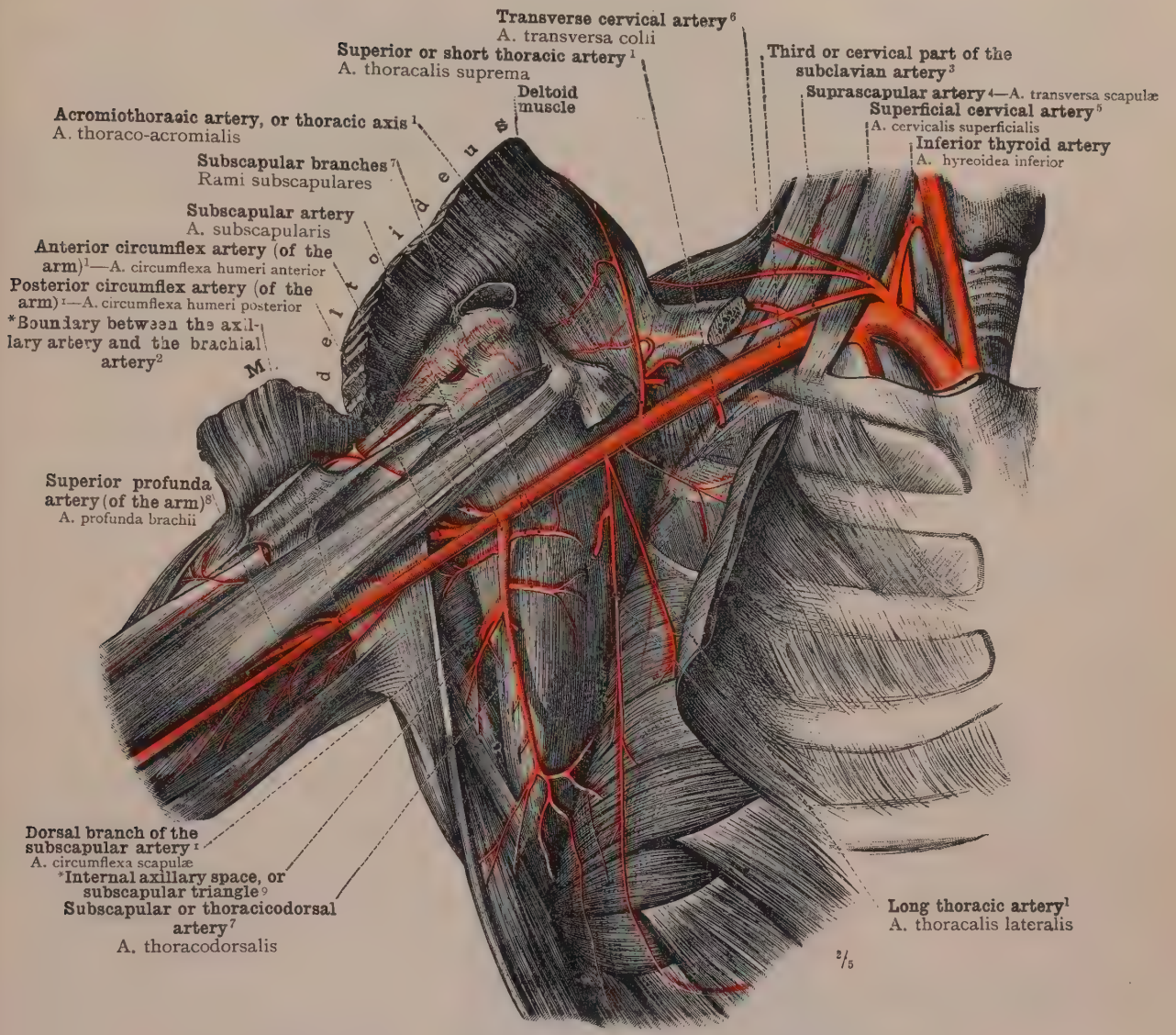


[1] See Appendix, note [203]. [2] Known also as the *transverse scapular* or *transverse humeral artery*.
[3] Or *posterior scapular artery* (Macalister). See Appendix, notes [134], [135], [172], and [208].
[4] Called by Macalister the *thoracico-acromial artery*.
[5] Often called the *dorsalis scapulæ* artery. See also Appendix, note [203]. [6] See Appendix, note [204].

FIG. 1017.—RIGHT SUBCLAVIAN AND AXILLARY ARTERIES AND THEIR RELATION TO THE BRACHIAL PLEXUS; SEEN FROM THE FRONT AND THE INNER SIDE. THE DIVISION OF THE INNOMINATE (OR BRACHIOCEPHALIC) ARTERY INTO RIGHT SUBCLAVIAN AND COMMON CAROTID ARTERIES. *THORACIC PORTION OF THE SUBCLAVIAN ARTERY (*see Appendix, note* [205]), WITH THE ORIGIN OF THE VERTEBRAL ARTERY, THE THYROID AXIS, AND THE INTERNAL MAMMARY ARTERY; THE CERVICAL (THIRD) PORTION OF THE SUBCLAVIAN ARTERY (*see Appendix, note* [205]), WITH THE ORIGIN OF THE TRANSVERSE CERVICAL ARTERY.

Of the branches of the axillary artery (*see Appendix, note* [206]) we see: the branches of the acromiothoracic artery, arteria thoraco-acromialis, the thoracic or pectoral branch, ramus pectoralis, the clavicular branch, ramus subclavius, the acromial branch, ramus acromialis, and the descending or humeral branch, ramus deltoideus; the long thoracic artery, arteria thoracalis lateralis; the (long) subscapular artery, arteria subscapularis, and its division into the dorsal scapular artery, arteria circumflexa scapulæ, and the thoracicodorsalis artery, arteria thoracodorsalis (*see Appendix note* [203]); the anterior and posterior circumflex arteries (of the arm), arteriæ circumflexæ humeri, anterior et posterior.

A. subclavia, the subclavian artery; A. axillaris, the axillary artery.

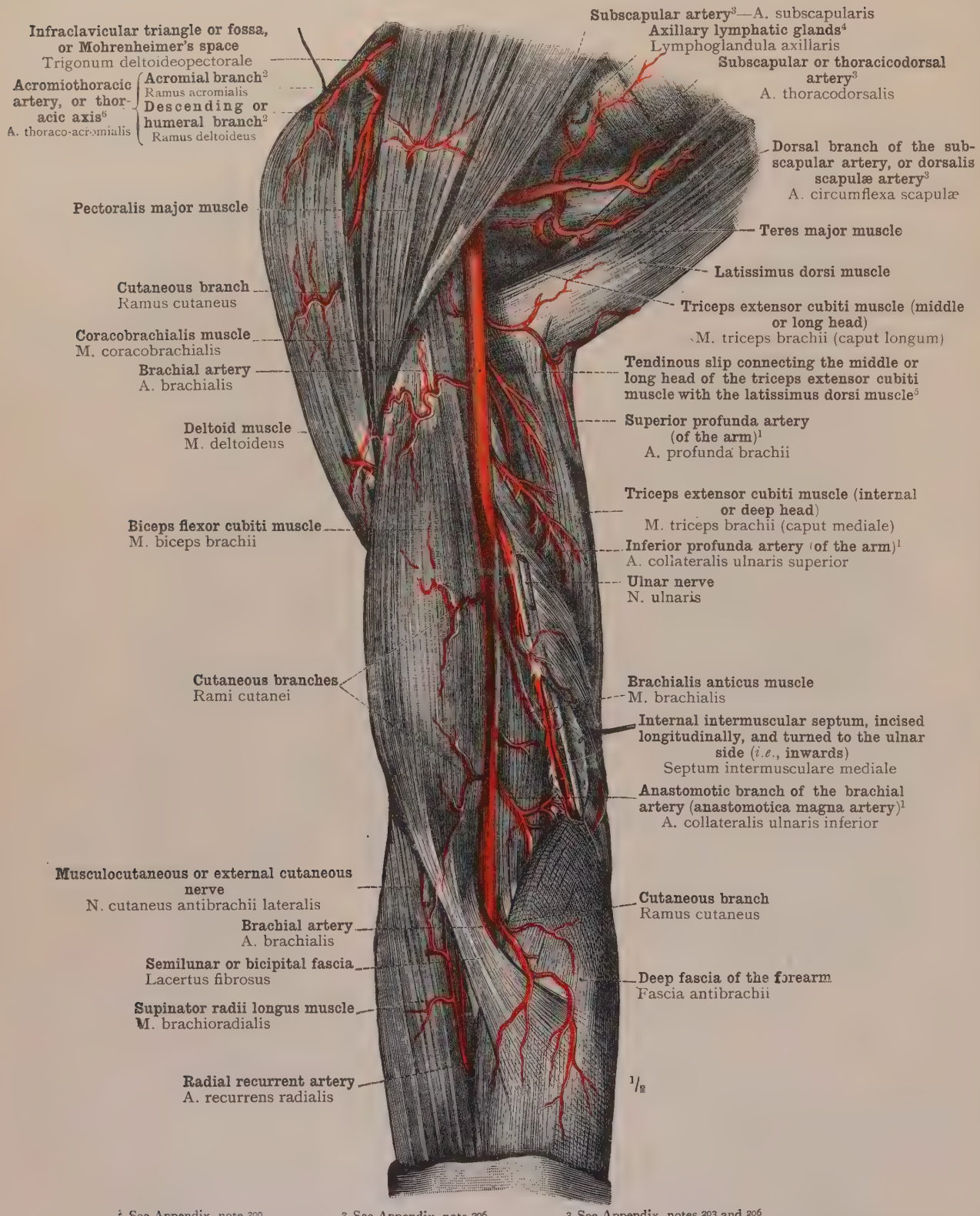

Transverse cervical artery[6]
A. transversa colli
Superior or short thoracic artery[1]
A. thoracalis suprema
Third or cervical part of the subclavian artery[3]
Deltoid muscle
Suprascapular artery[4]—A. transversa scapulæ
Superficial cervical artery[5]
A. cervicalis superficialis
Acromiothoracic artery, or thoracic axis[1]
A. thoraco-acromialis
Inferior thyroid artery
A. hyreoidea inferior
Subscapular branches[7]
Rami subscapulares
Subscapular artery
A. subscapularis
Anterior circumflex artery (of the arm)[1]—A. circumflexa humeri anterior
Posterior circumflex artery (of the arm)[1]—A. circumflexa humeri posterior
*Boundary between the axillary artery and the brachial artery[2]
Superior profunda artery (of the arm)[8]
A. profunda brachii
Dorsal branch of the subscapular artery[1]
A. circumflexa scapulæ
*Internal axillary space, or subscapular triangle[9]
Subscapular or thoracicodorsal artery[7]
A. thoracodorsalis
Long thoracic artery[1]
A. thoracalis lateralis
2/5

[1] See Appendix, note [206]. [2] See Appendix, note [207]. 3 See Appendix, note [205].
4 Known also as the *transverse scapular or transverse humeral artery.* 5 See Appendix, note [208].
6 See Appendix, notes [134], [135], [172], and [208]. 7 See Appendix, notes [203] and [206].
8 See Appendix, note [209]. 9 See Part III. of this work, p. 312, Fig. 559, and note [1] to same page.

FIG. 1018.—THE DISTRIBUTION OF THE BRANCHES OF THE AXILLARY ARTERY AS SEEN AFTER THE ANTERIOR WALL OF THE AXILLA AND THE BRACHIAL PLEXUS HAVE BEEN ENTIRELY REMOVED; SEEN FROM THE FRONT AND THE INNER SIDE. THE SUPERIOR OR SHORT THORACIC ARTERY, ARTERIA THORACICA SUPREMA; THE LONG THORACIC ARTERY, ARTERIA THORACALIS LATERALIS; THE ACROMIOTHORACIC ARTERY, OR THORACIC AXIS, ARTERIA THORACO-ACROMIALIS; THE SUBSCAPULAR ARTERY, ARTERIA SUBSCAPULARIS, GIVING OFFSETS TO THE SUBSCAPULARIS MUSCLE, RAMI SUBSCAPULARES, AND DIVIDING (*see Appendix, notes* [203] *and* [206]) INTO THE ARTERIA THORACODORSALIS (CONTINUATION OF THE SUBSCAPULAR ARTERY, OR THORACICODORSAL ARTERY) AND THE ARTERIA CIRCUMFLEXA SCAPULÆ (DORSAL BRANCH OF THE SUBSCAPULAR ARTERY, OR DORSALIS SCAPULÆ ARTERY); THE ANTERIOR AND POSTERIOR CIRCUMFLEX ARTERIES (OF THE ARM), ARTERIÆ CIRCUMFLEXÆ HUMERI ANTERIOR ET POSTERIOR.

In the preparation shown in Fig. 1017, the sternal extremity of the clavicle and the pectoralis major muscle were removed; the pectoralis minor muscle was cut across, its inner segment being turned towards the median line, and the brachial plexus was removed. The arm was abducted, a transverse incision was made into the anterior border of the deltoid muscle, and this muscle was turned outwards, in order to display the course of the anterior circumflex artery (of the arm) and its anterior articular branch. Regarding the branches of the axillary artery, *see Appendix, note* [206]; and regarding the parts of the axillary artery, *see Appendix, note* [207].

A. subclavia, the subclavian artery; A. axillaris, the axillary artery.



[1] See Appendix, note 209. [2] See Appendix, note 206. [3] See Appendix, notes 203 and 206.

[4] This being one of the glands lying on the serratus magnus muscle at the lower border of the pectoral muscles, belongs to the *pectoral* group of *axillary* lymphatic glands (Quain).—Tr.

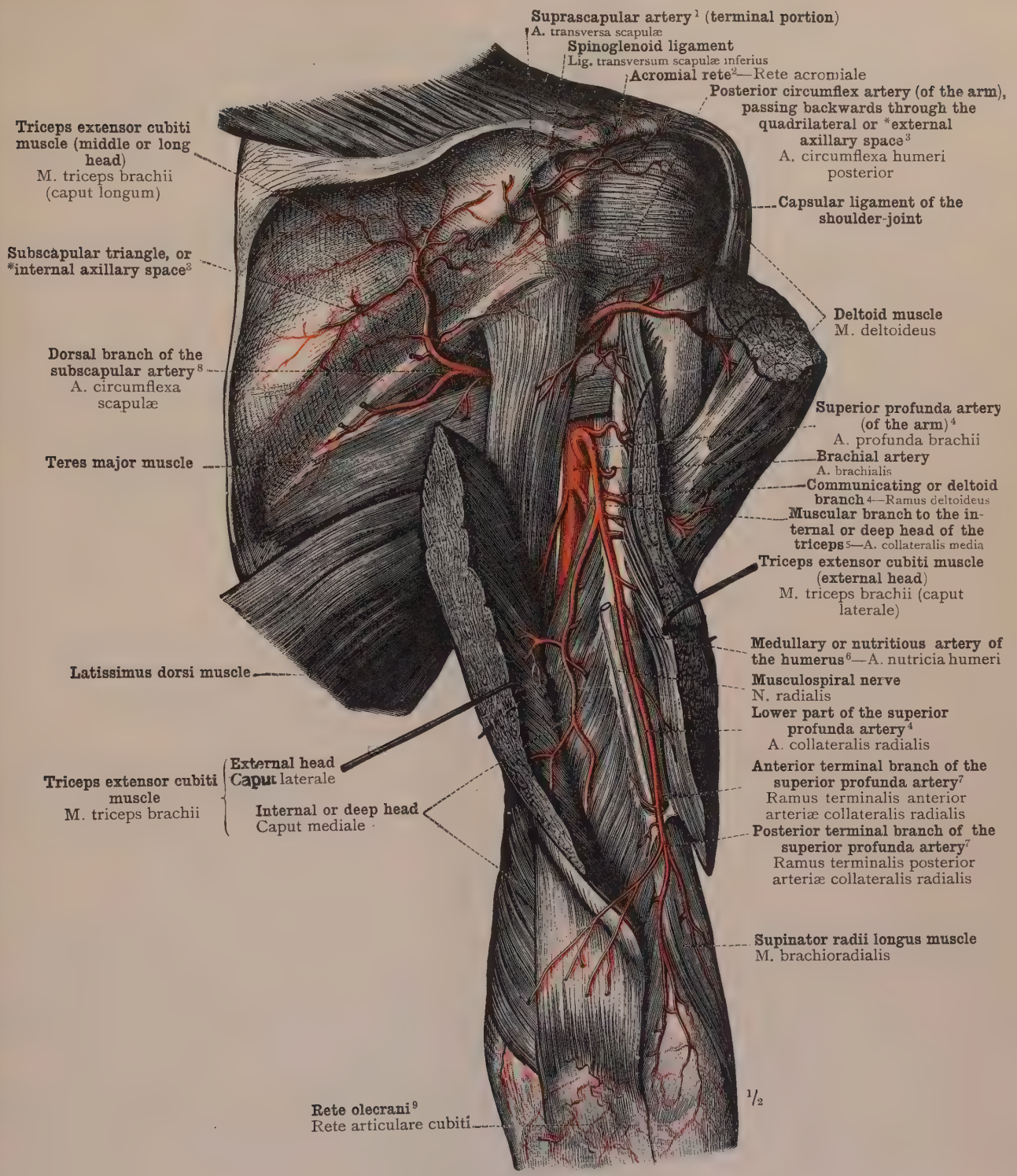
[5] This slip is vestigial in nature, representing the *dorso-epitrochlearis* or *accessorius tricipitis muscle* which is commonly met with in quadrumana, and exists in many other mammals. (See Quain. *op. cit.*, vol. ii., pp. 206 and 221, and Macalister, *op. cit.*, p. 290.)—Tr.

[6] Called by Macalister the *thoracico-acromial artery*. See Appendix, note 206.

FIG. 1019.—THE ARTERIES OF THE RIGHT UPPER ARM, SHOULDER, AND AXILLARY REGION; SEEN FROM THE FRONT AND THE INNER SIDE.

Regarding the branches of the brachial artery, *see Appendix, note* 209; and regarding the upper limit of the brachial artery, *see Appendix, note* 210.

The Arteries of the Upper Arm and the Shoulder.

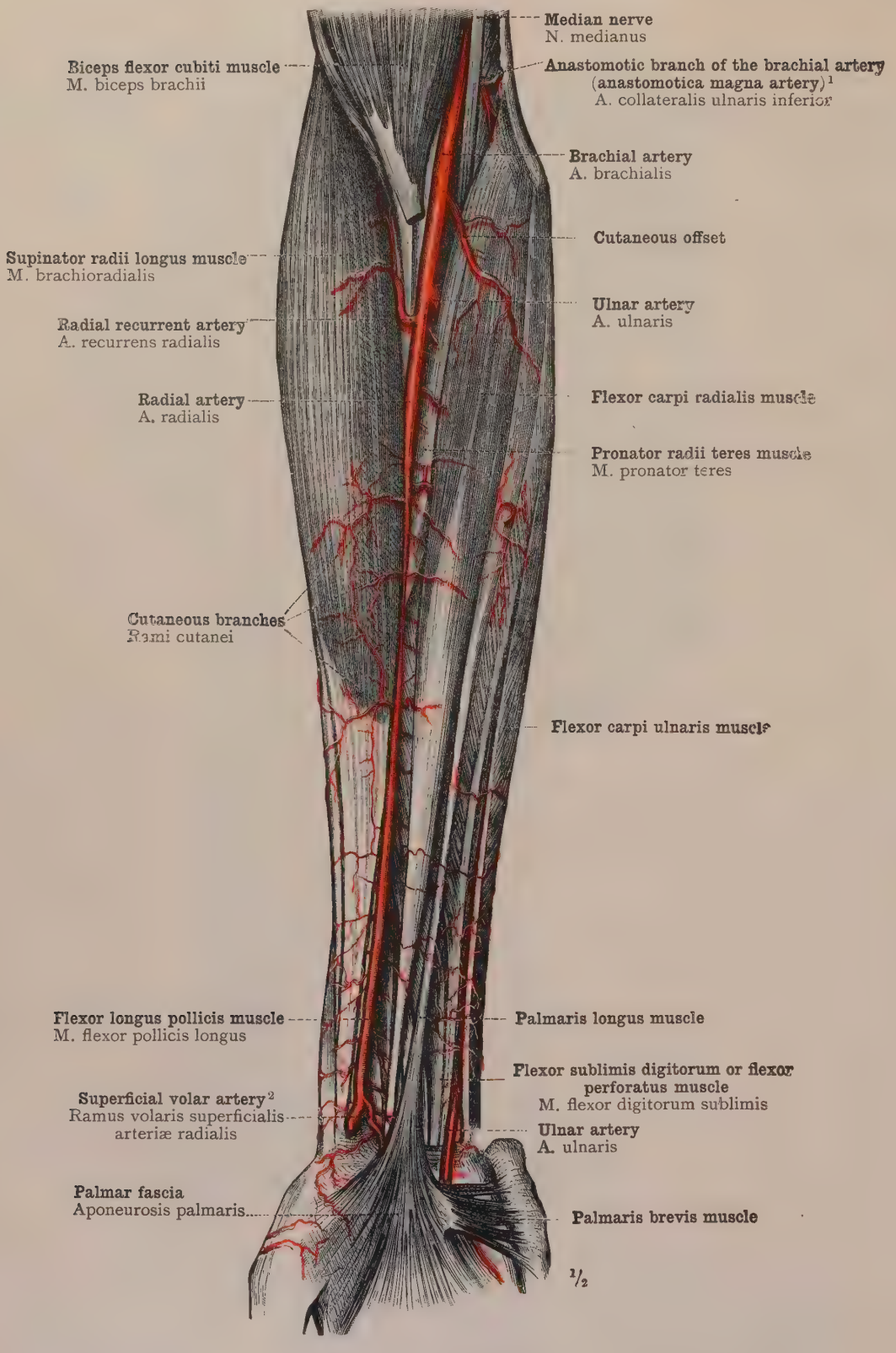

Suprascapular artery[1] (terminal portion)
A. transversa scapulæ
Spinoglenoid ligament
Lig. transversum scapulæ inferius
Acromial rete[2]—Rete acromiale
Posterior circumflex artery (of the arm), passing backwards through the quadrilateral or *external axillary space[3]
A. circumflexa humeri posterior
Capsular ligament of the shoulder-joint
Triceps extensor cubiti muscle (middle or long head)
M. triceps brachii (caput longum)
Subscapular triangle, or *internal axillary space[5]
Deltoid muscle
M. deltoideus
Dorsal branch of the subscapular artery[8]
A. circumflexa scapulæ
Superior profunda artery (of the arm)[4]
A. profunda brachii
Teres major muscle
Brachial artery
A. brachialis
Communicating or deltoid branch[4]—Ramus deltoideus
Muscular branch to the internal or deep head of the triceps[5]—A. collateralis media
Triceps extensor cubiti muscle (external head)
M. triceps brachii (caput laterale)
Medullary or nutritious artery of the humerus[6]—A. nutricia humeri
Latissimus dorsi muscle
Musculospiral nerve
N. radialis
Lower part of the superior profunda artery[4]
A. collateralis radialis
Triceps extensor cubiti muscle
M. triceps brachii
External head
Caput laterale
Internal or deep head
Caput mediale
Anterior terminal branch of the superior profunda artery[7]
Ramus terminalis anterior arteriæ collateralis radialis
Posterior terminal branch of the superior profunda artery[7]
Ramus terminalis posterior arteriæ collateralis radialis
Supinator radii longus muscle
M. brachioradialis
Rete olecrani[9]
Rete articulare cubiti
1/2

1 Known also as the *transverse scapular* or *transverse humeral artery.* 2 See Appendix, note [170].
3 See note [1] to p. 312 in Part III. 4 See Appendix, note [209].
5 Arising in this instance direct from the brachial artery, instead of, as normally, from the superior profunda artery. See Appendix, note [209].
6 This is the *medullary* or *nutritious branch* of the *superior profunda artery*, not the *chief medullary artery* of the humerus, which enters a foramen somewhat lower down in the shaft of the humerus. See Appendix, note [209].
7 See Appendix, note [211]. 8 See Appendix, notes [203] and [206]. 9 See Appendix, note [212].

FIG. 1020.—THE DEEP ARTERIES AT THE BACK OF THE RIGHT UPPER ARM AND THE RIGHT SHOULDER; THE ARTERIAL NETWORK OF THE ELBOW, RETE OLECRANI OR RETE ARTICULARE CUBITI (*see Appendix, note* [212]).

The posterior part of the deltoid muscle was removed, in addition to the infraspinatus and teres minor muscles, and the external head of the triceps extensor cubiti muscle was divided by a longitudinal incision, the parts being widely separated.

Arteries of the Upper Arm and the Shoulder.

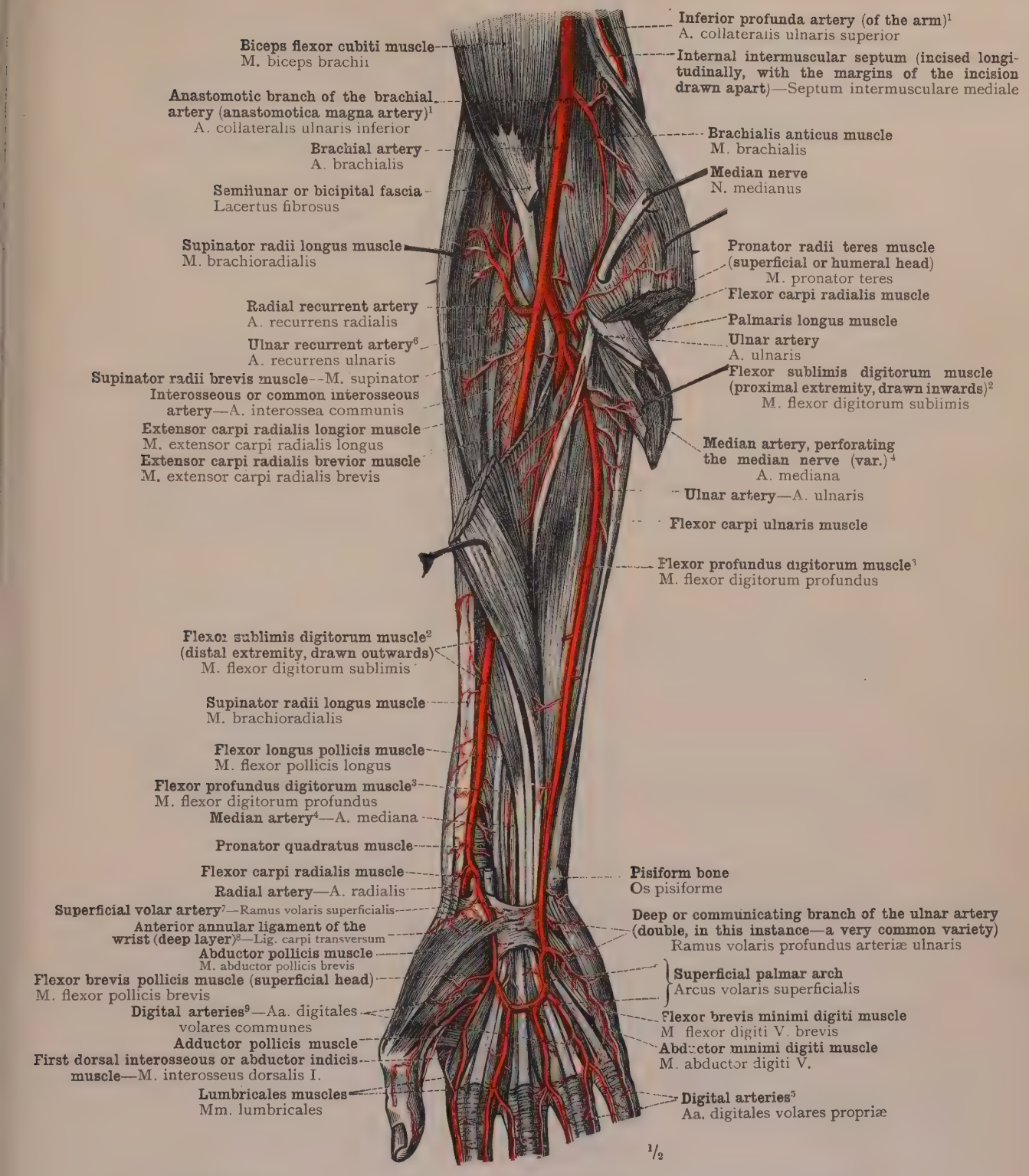


[1] See Appendix, note [209].

[2] Often known in England by the Latin name of *superficialis volæ artery*.—Tr.

FIG. 1021.—THE SUPERFICIAL ARTERIES OF THE ANTECUBITAL FOSSA AND THE PALMAR SURFACE OF THE RIGHT FOREARM.

Palmar Arteries of the Forearm and the Hand.

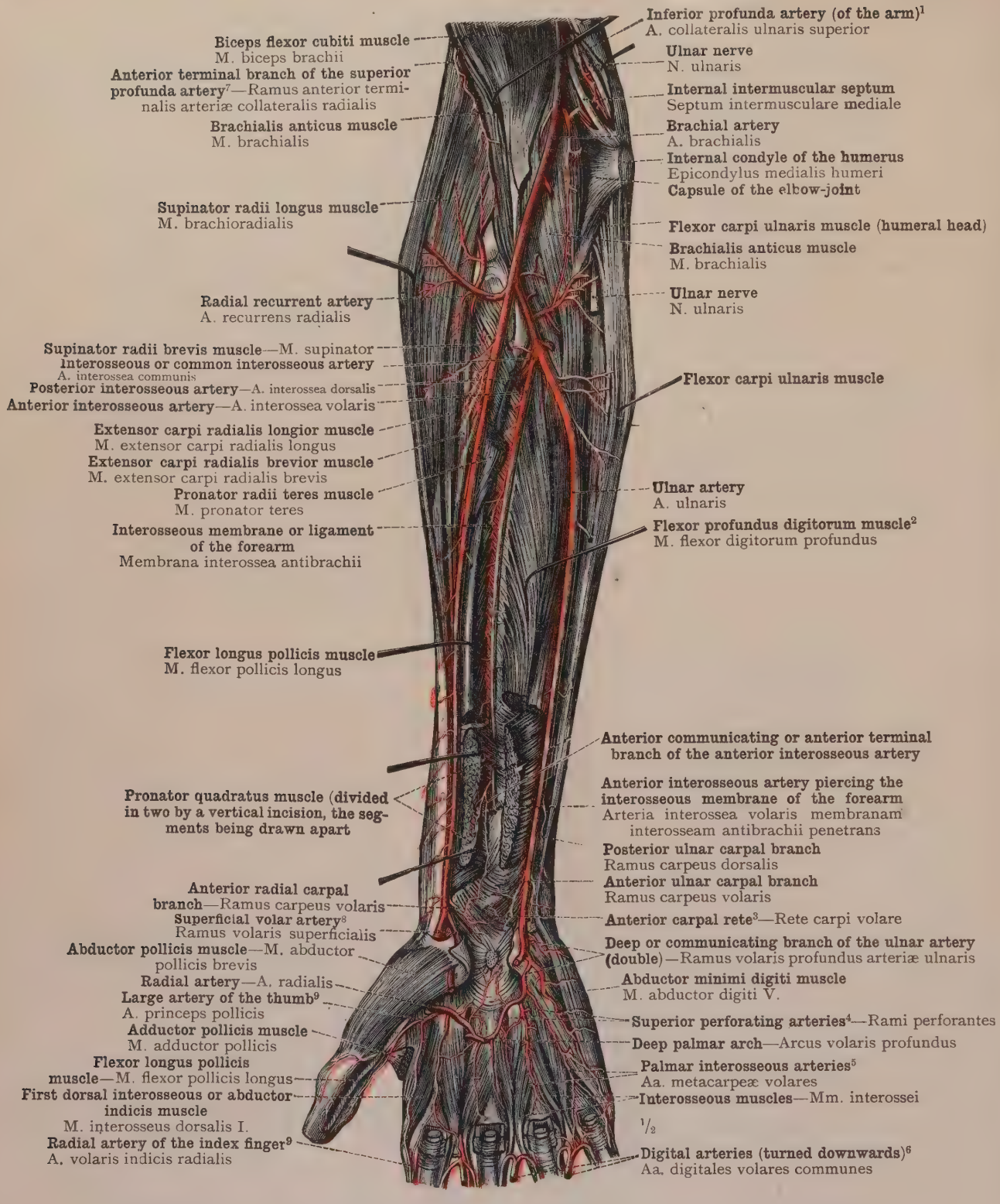

Inferior profunda artery (of the arm)[1]
A. collateralis ulnaris superior
Biceps flexor cubiti muscle
M. biceps brachii
Internal intermuscular septum (incised longitudinally, with the margins of the incision drawn apart)—Septum intermusculare mediale
Anastomotic branch of the brachial artery (anastomotica magna artery)[1]
A. collateralis ulnaris inferior
Brachialis anticus muscle
M. brachialis
Brachial artery
A. brachialis
Median nerve
N. medianus
Semilunar or bicipital fascia
Lacertus fibrosus
Supinator radii longus muscle
M. brachioradialis
Pronator radii teres muscle (superficial or humeral head)
M. pronator teres
Flexor carpi radialis muscle
Radial recurrent artery
A. recurrens radialis
Palmaris longus muscle
Ulnar recurrent artery[6]
A. recurrens ulnaris
Ulnar artery
A. ulnaris
Supinator radii brevis muscle—M. supinator
Flexor sublimis digitorum muscle (proximal extremity, drawn inwards)[2]
M. flexor digitorum sublimis
Interosseous or common interosseous artery—A. interossea communis
Extensor carpi radialis longior muscle
M. extensor carpi radialis longus
Median artery, perforating the median nerve (var.)[4]
A. mediana
Extensor carpi radialis brevior muscle
M. extensor carpi radialis brevis
Ulnar artery—A. ulnaris
Flexor carpi ulnaris muscle
Flexor profundus digitorum muscle[3]
M. flexor digitorum profundus
Flexor sublimis digitorum muscle[2] (distal extremity, drawn outwards)
M. flexor digitorum sublimis
Supinator radii longus muscle
M. brachioradialis
Flexor longus pollicis muscle
M. flexor pollicis longus
Flexor profundus digitorum muscle[3]
M. flexor digitorum profundus
Median artery[4]—A. mediana
Pronator quadratus muscle
Flexor carpi radialis muscle
Pisiform bone
Os pisiforme
Radial artery—A. radialis
Superficial volar artery[7]—Ramus volaris superficialis
Deep or communicating branch of the ulnar artery (double, in this instance—a very common variety)
Ramus volaris profundus arteriæ ulnaris
Anterior annular ligament of the wrist (deep layer)[8]—Lig. carpi transversum
Abductor pollicis muscle
M. abductor pollicis brevis
Superficial palmar arch
Arcus volaris superficialis
Flexor brevis pollicis muscle (superficial head)
M. flexor pollicis brevis
Digital arteries[9]—Aa. digitales volares communes
Flexor brevis minimi digiti muscle
M flexor digiti V. brevis
Adductor pollicis muscle
Abductor minimi digiti muscle
M. abductor digiti V.
First dorsal interosseous or abductor indicis muscle—M. interosseus dorsalis I.
Lumbricales muscles
Mm. lumbricales
Digital arteries[5]
Aa. digitales volares propriæ
1/2

[1] See Appendix, note [209].
[2] Or *flexor perforatus* muscle.
[3] Or *flexor perforans* muscle.
[4] *Median Artery.*—Called by Macalister *comes nervi mediani artery.*
[5] Or *collateral digital arteries*, see Appendix, note [213].
[6] The *anterior ulnar recurrent artery* and the *posterior ulnar recurrent artery* are here seen arising by a common stem. This variety is of frequent occurrence.—Tr.
[7] See note [2] to p. 632.
[8] See Appendix, note [214].
[9] See Appendix, note [213].

FIG. 1022.—THE RADIAL AND ULNAR ARTERIES AND THE SUPERFICIAL PALMAR ARCH.

The unusually large median artery (comes nervi mediani artery) perforates in this specimen the median nerve.

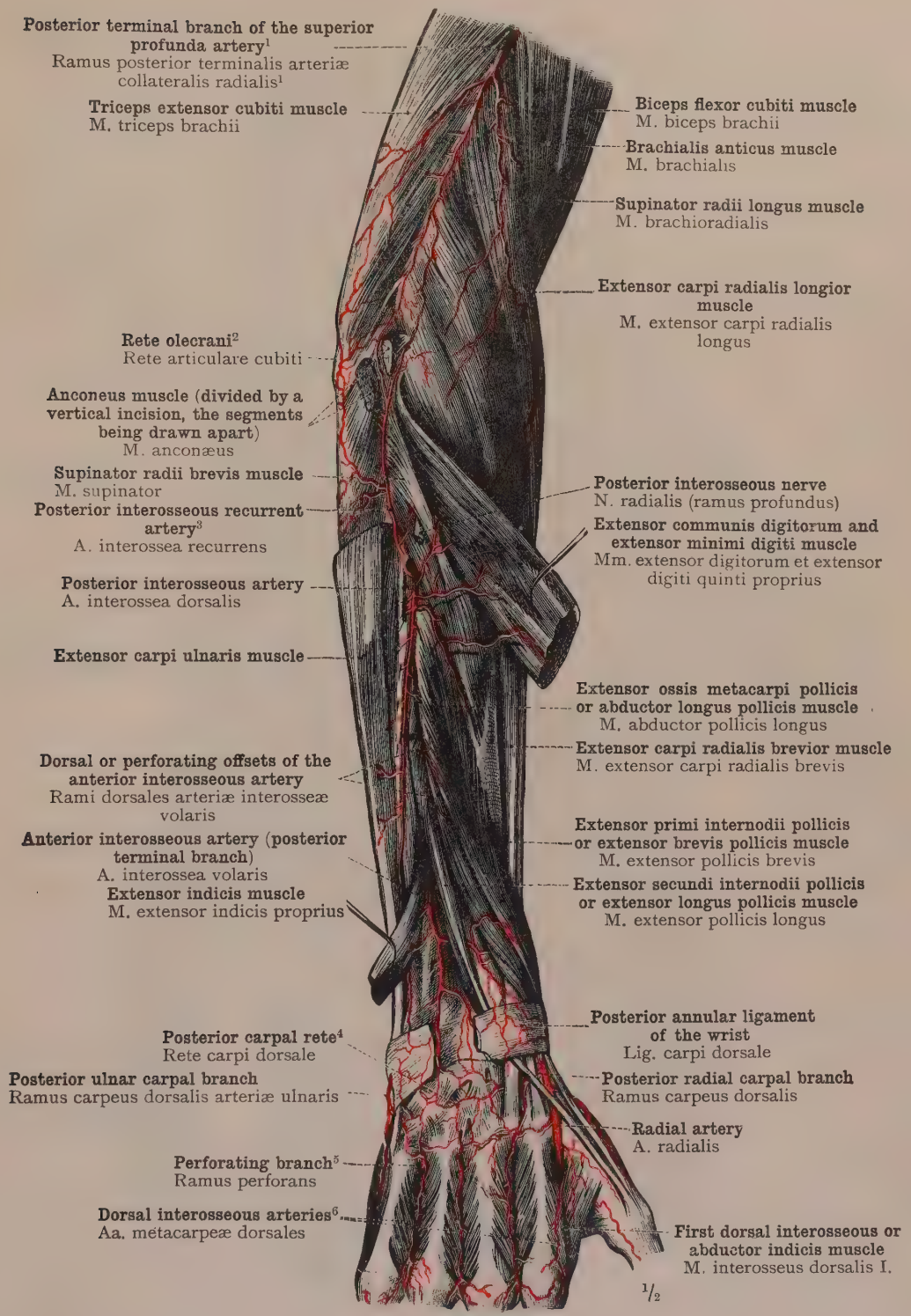
Palmar Arteries of the Forearm and Hand.


Inferior profunda artery (of the arm)[1]
A. collateralis ulnaris superior
Biceps flexor cubiti muscle
M. biceps brachii
Ulnar nerve
N. ulnaris
Anterior terminal branch of the superior profunda artery[7]—Ramus anterior terminalis arteriæ collateralis radialis
Internal intermuscular septum
Septum intermusculare mediale
Brachialis anticus muscle
M. brachialis
Brachial artery
A. brachialis
Internal condyle of the humerus
Epicondylus medialis humeri
Capsule of the elbow-joint
Supinator radii longus muscle
M. brachioradialis
Flexor carpi ulnaris muscle (humeral head)
Brachialis anticus muscle
M. brachialis
Radial recurrent artery
A. recurrens radialis
Ulnar nerve
N. ulnaris
Supinator radii brevis muscle—M. supinator
Interosseous or common interosseous artery
A. interossea communis
Flexor carpi ulnaris muscle
Posterior interosseous artery—A. interossea dorsalis
Anterior interosseous artery—A. interossea volaris
Extensor carpi radialis longior muscle
M. extensor carpi radialis longus
Extensor carpi radialis brevior muscle
M. extensor carpi radialis brevis
Ulnar artery
A. ulnaris
Pronator radii teres muscle
M. pronator teres
Interosseous membrane or ligament of the forearm
Membrana interossea antibrachii
Flexor profundus digitorum muscle[2]
M. flexor digitorum profundus
Flexor longus pollicis muscle
M. flexor pollicis longus
Anterior communicating or anterior terminal branch of the anterior interosseous artery
Anterior interosseous artery piercing the interosseous membrane of the forearm
Arteria interossea volaris membranam interosseam antibrachii penetrans
Pronator quadratus muscle (divided in two by a vertical incision, the segments being drawn apart
Posterior ulnar carpal branch
Ramus carpeus dorsalis
Anterior ulnar carpal branch
Ramus carpeus volaris
Anterior radial carpal branch—Ramus carpeus volaris
Superficial volar artery[8]
Ramus volaris superficialis
Anterior carpal rete[3]—Rete carpi volare
Deep or communicating branch of the ulnar artery (double)—Ramus volaris profundus arteriæ ulnaris
Abductor pollicis muscle—M. abductor pollicis brevis
Radial artery—A. radialis
Abductor minimi digiti muscle
M. abductor digiti V.
Large artery of the thumb[9]
A. princeps pollicis
Superior perforating arteries[4]—Rami perforantes
Adductor pollicis muscle
M. adductor pollicis
Deep palmar arch—Arcus volaris profundus
Flexor longus pollicis muscle—M. flexor pollicis longus
Palmar interosseous arteries[5]
Aa. metacarpeæ volares
First dorsal interosseous or abductor indicis muscle
M. interosseus dorsalis I.
Interosseous muscles—Mm. interossei
1/2
Radial artery of the index finger[9]
A. volaris indicis radialis
Digital arteries (turned downwards)[6]
Aa. digitales volares communes

[1] See Appendix, note 209. [2] Or *flexor perforans* muscle. [3] See Appendix, note 215. [4] See Appendix, note 216.
[5] Called by Macalister the *descending digital branches* of the *deep palmar arch*. [6] See Appendix, note 213.
[7] See Appendix, note 217. [8] See note [2] to p. 632. [9] See Appendix, note 218.

FIG. 1023.—THE ANTERIOR INTEROSSEOUS ARTERY OF THE RIGHT FOREARM AND THE DEEP PALMAR ARCH; SEEN FROM BEFORE.

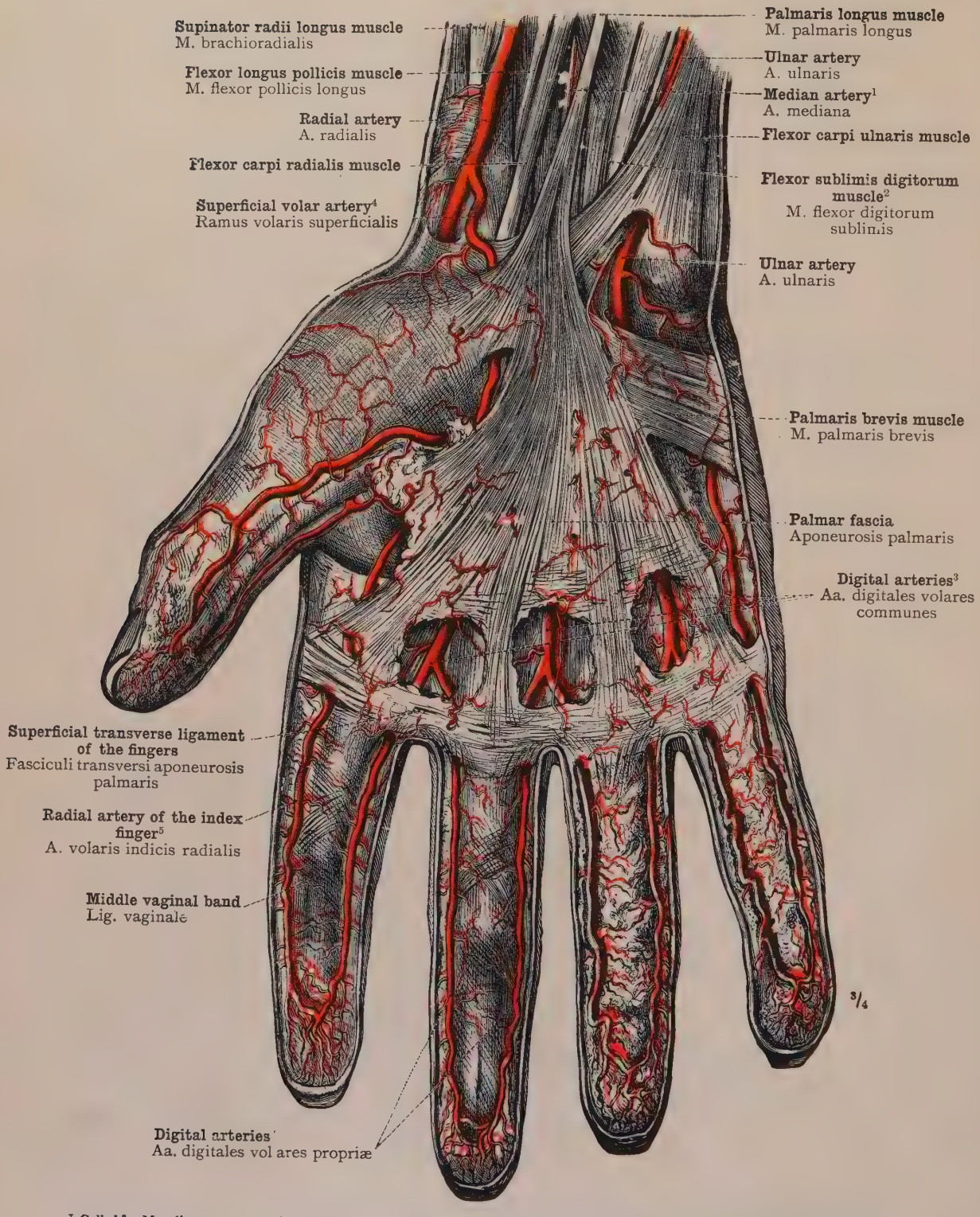
Palmar Arteries of the Forearm and Hand.


Posterior terminal branch of the superior profunda artery[1]
Ramus posterior terminalis arteriæ collateralis radialis[1]
Triceps extensor cubiti muscle
M. triceps brachii
Biceps flexor cubiti muscle
M. biceps brachii
Brachialis anticus muscle
M. brachialis
Supinator radii longus muscle
M. brachioradialis
Extensor carpi radialis longior muscle
M. extensor carpi radialis longus
Rete olecrani[2]
Rete articulare cubiti
Anconeus muscle (divided by a vertical incision, the segments being drawn apart)
M. anconæus
Supinator radii brevis muscle
M. supinator
Posterior interosseous recurrent artery[3]
A. interossea recurrens
Posterior interosseous nerve
N. radialis (ramus profundus)
Extensor communis digitorum and extensor minimi digiti muscle
Mm. extensor digitorum et extensor digiti quinti proprius
Posterior interosseous artery
A. interossea dorsalis
Extensor carpi ulnaris muscle
Extensor ossis metacarpi pollicis or abductor longus pollicis muscle
M. abductor pollicis longus
Extensor carpi radialis brevior muscle
M. extensor carpi radialis brevis
Dorsal or perforating offsets of the anterior interosseous artery
Rami dorsales arteriæ interosseæ volaris
Anterior interosseous artery (posterior terminal branch)
A. interossea volaris
Extensor indicis muscle
M. extensor indicis proprius
Extensor primi internodii pollicis or extensor brevis pollicis muscle
M. extensor pollicis brevis
Extensor secundi internodii pollicis or extensor longus pollicis muscle
M. extensor pollicis longus
Posterior annular ligament of the wrist
Lig. carpi dorsale
Posterior carpal rete[4]
Rete carpi dorsale
Posterior ulnar carpal branch
Ramus carpeus dorsalis arteriæ ulnaris
Posterior radial carpal branch
Ramus carpeus dorsalis
Radial artery
A. radialis
Perforating branch[5]
Ramus perforans
Dorsal interosseous arteries[6]
Aa. metacarpeæ dorsales
First dorsal interosseous or abductor indicis muscle
M. interosseus dorsalis I.
1/2

[1] See Appendix, note [217].
[2] See Appendix, note [212].
[3] Often called the *interosseous recurrent* artery without further qualification, as the anterior interosseous artery gives no recurrent branch.—Tr.
[4] See Appendix, note [29].
[5] See Appendix, note [216].
[6] See Appendix, note [220].

FIG. 1024.—ARTERIÆ INTEROSSEA DORSALIS ET INTEROSSEA RECURRENS, THE POSTERIOR INTEROSSEOUS AND POSTERIOR INTEROSSEOUS RECURRENT ARTERIES; THE POSTERIOR OR POSTERIOR TERMINAL BRANCH OF THE ANTERIOR INTEROSSEOUS ARTERY, ARTERIA INTEROSSEA VOLARIS; THE DEEP ARTERIES OF THE DORSUM OF THE HAND

Dorsal Arteries of the Forearm and Hand.

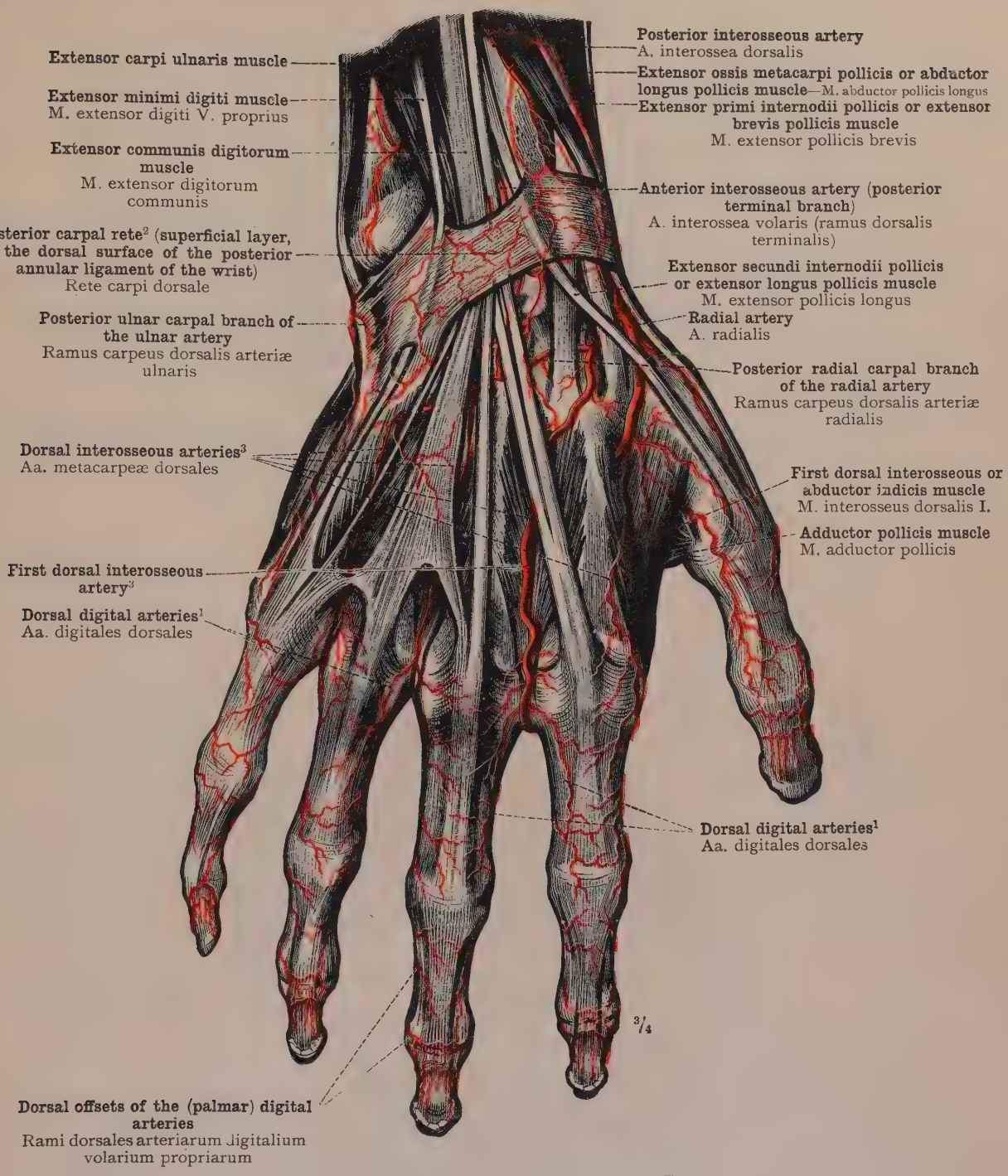


[1] Called by Macalister *comes nervi mediani artery*. [2] Or *flexor perforatus* muscle. [3] See Appendix, note [213].
[4] See note [2] to p. 632. [5] See Appendix, note [218]. [6] Or *collateral digital arteries*. See Appendix, note [213].

FIG. 1025.— THE SUPERFICIAL ARTERIES OF THE PALM OF THE HAND; THE PALMAR DIGITAL ARTERIES.

In the thumb, the index, and the middle finger, the skin and the superficial fascia have been removed, thus exposing the digital sheaths of the flexor tendons (ligamenta vaginalia, etc.). In the ring and little fingers, the superficial fascia and the arteries ramifying in it have been preserved.

Arteries of the Palm of the Hand.


Extensor carpi ulnaris muscle
Extensor minimi digiti muscle
M. extensor digiti V. proprius
Extensor communis digitorum muscle
M. extensor digitorum communis
Posterior carpal rete[2] (superficial layer, on the dorsal surface of the posterior annular ligament of the wrist)
Rete carpi dorsale
Posterior ulnar carpal branch of the ulnar artery
Ramus carpeus dorsalis arteriæ ulnaris
Dorsal interosseous arteries[3]
Aa. metacarpeæ dorsales
First dorsal interosseous artery[3]
Dorsal digital arteries[1]
Aa. digitales dorsales
Dorsal offsets of the (palmar) digital arteries
Rami dorsales arteriarum digitalium volarium propriarum
Posterior interosseous artery
A. interossea dorsalis
Extensor ossis metacarpi pollicis or abductor longus pollicis muscle—M. abductor pollicis longus
Extensor primi internodii pollicis or extensor brevis pollicis muscle
M. extensor pollicis brevis
Anterior interosseous artery (posterior terminal branch)
A. interossea volaris (ramus dorsalis terminalis)
Extensor secundi internodii pollicis or extensor longus pollicis muscle
M. extensor pollicis longus
Radial artery
A. radialis
Posterior radial carpal branch of the radial artery
Ramus carpeus dorsalis arteriæ radialis
First dorsal interosseous or abductor indicis muscle
M. interosseus dorsalis I.
Adductor pollicis muscle
M. adductor pollicis
Dorsal digital arteries[1]
Aa. digitales dorsales
3/4

[1] These minute vessels are often ignored by English anatomists See Appendix, note [213].—TR.
[2] See Appendix, note [219].
[3] The *first dorsal interosseous artery* is called by Macalister the *metacarpal branch* of the *radial artery*. For the origin of this and of the other dorsal interosseous arteries, see Appendix, note [220].—TR.

FIG. 1026.—THE SUPERFICIAL ARTERIES OF THE DORSUM OF THE HAND: THE RADIAL ARTERY, ARTERIA RADIALIS; THE POSTERIOR RADIAL CARPAL ARTERY, RAMUS CARPEUS DORSALIS ARTERIÆ RADIALIS, AND THE POSTERIOR ULNAR CARPAL ARTERY, RAMUS CARPEUS DORSALIS ARTERIÆ ULNARIS; THE POSTERIOR TERMINAL BRANCH OF THE ANTERIOR INTEROSSEOUS ARTERY, RAMUS DORSALIS TERMINALIS ARTERIÆ INTEROSSEÆ VOLARIS; THE SUPERFICIAL LAYER OF THE POSTERIOR CARPAL RETE, LAMINA SUPERFICIALIS RETIS CARPI DORSALIS; THE DORSAL INTEROSSEOUS ARTERIES, ARTERIÆ METACARPEÆ DORSALES; THAT OCCUPYING THE BACK OF THE SECOND SPACE (FIRST DORSAL INTEROSSEOUS ARTERY, ACCORDING TO QUAIN; METACARPAL BRANCH OF THE RADIAL ARTERY, ACCORDING TO MACALISTER) IS UNUSUALLY LARGE (A COMMON VARIETY). THE DORSAL DIGITAL ARTERIES, ARTERIÆ DIGITALES DORSALES, AND THE DORSAL OFFSETS OF THE PALMAR DIGITAL ARTERIES, RAMI DORSALES ARTERIARUM DIGITALIUM VOLARIUM PROPRIARUM. THE RIGHT HAND WITH THE DISTAL EXTREMITY OF THE FOREARM; SEEN FROM BEHIND.

Arteries of the Dorsum of the Hand.

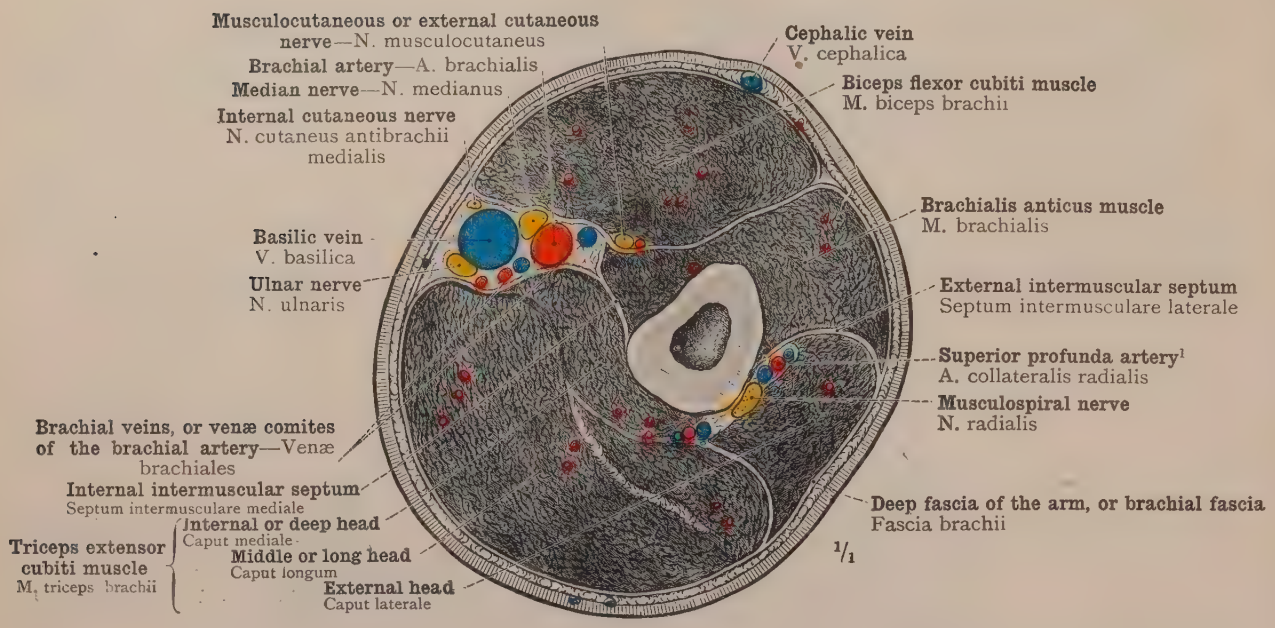


FIG. 1027.—TRANSVERSE SECTION THROUGH THE MIDDLE OF THE RIGHT UPPER ARM; UPPER SURFACE OF LOWER SEGMENT.

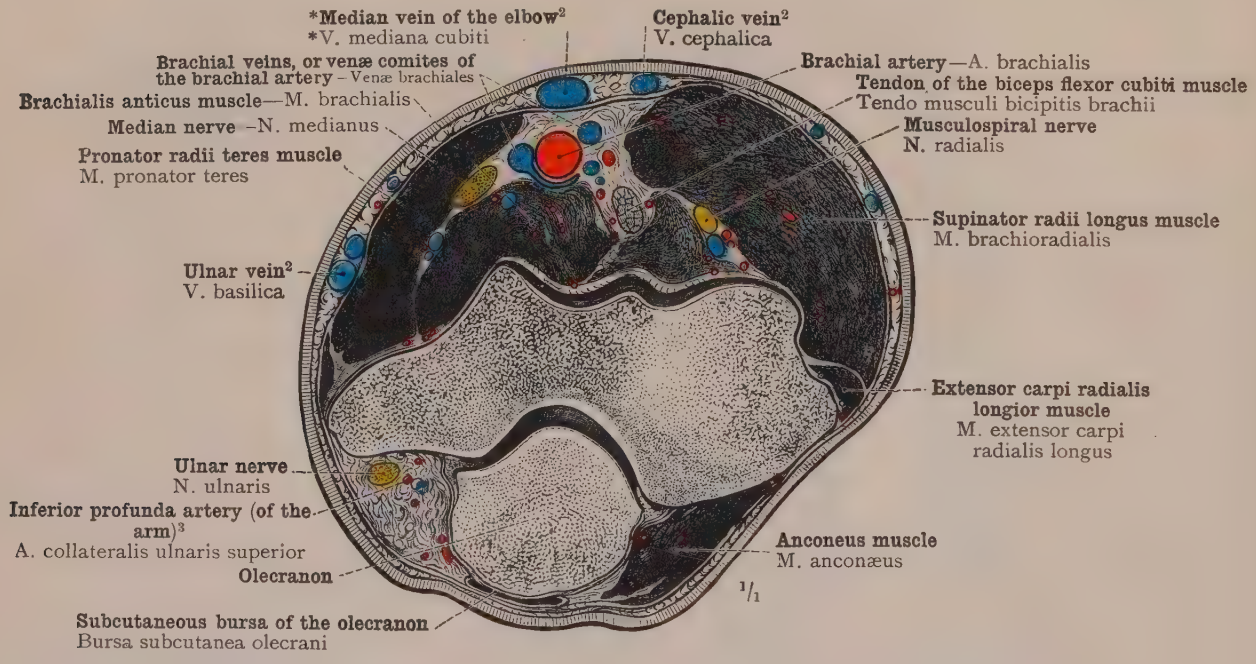
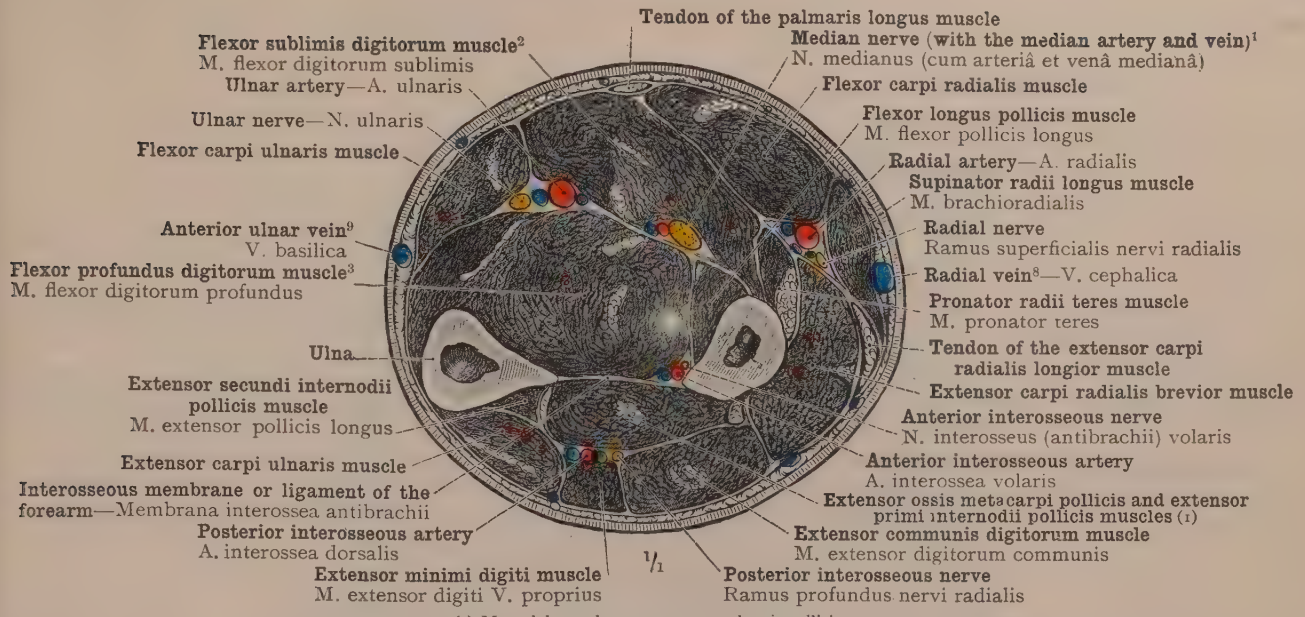


FIG. 1028.—TRANSVERSE SECTION THROUGH THE EXTENDED ELBOW-JOINT AT THE LEVEL OF THE TWO CONDYLES; UPPER SURFACE OF LOWER SEGMENT.

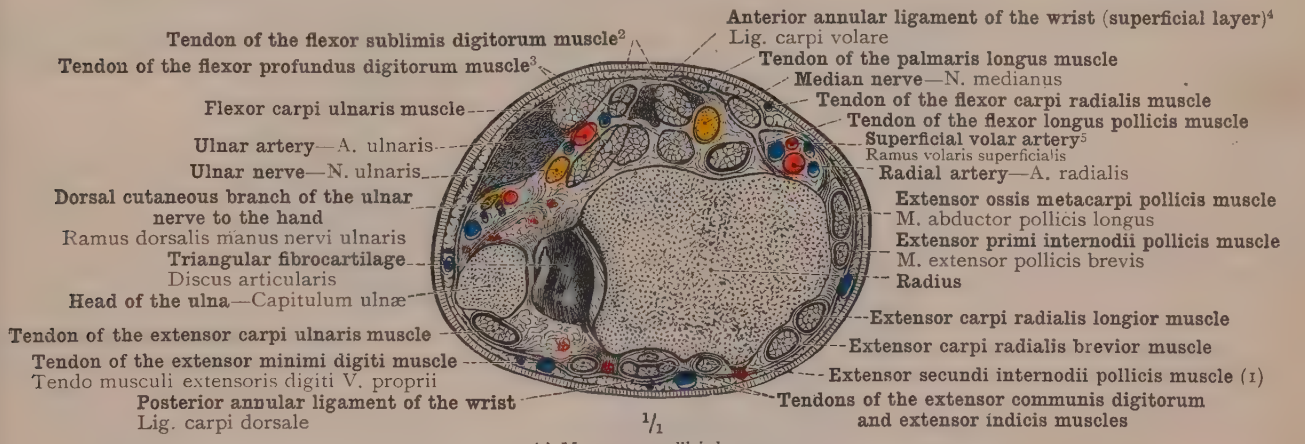
[1] See Appendix, notes 209 and 217. [2] See Appendix, note 221. [3] See Appendix, note 209.

Topographical Anatomy of the Upper Arm and the Elbow.


Tendon of the palmaris longus muscle
Flexor sublimis digitorum muscle[2]
M. flexor digitorum sublimis
Median nerve (with the median artery and vein)[1]
N. medianus (cum arteriâ et venâ medianâ)
Ulnar artery—A. ulnaris
Flexor carpi radialis muscle
Ulnar nerve—N. ulnaris
Flexor longus pollicis muscle
M. flexor pollicis longus
Flexor carpi ulnaris muscle
Radial artery—A. radialis
Supinator radii longus muscle
M. brachioradialis
Anterior ulnar vein[9]
V. basilica
Radial nerve
Ramus superficialis nervi radialis
Flexor profundus digitorum muscle[3]
M. flexor digitorum profundus
Radial vein[8]—V. cephalica
Pronator radii teres muscle
M. pronator teres
Ulna
Tendon of the extensor carpi radialis longior muscle
Extensor secundi internodii pollicis muscle
M. extensor pollicis longus
Extensor carpi radialis brevior muscle
Anterior interosseous nerve
N. interosseus (antibrachii) volaris
Extensor carpi ulnaris muscle
Anterior interosseous artery
A. interossea volaris
Interosseous membrane or ligament of the forearm—Membrana interossea antibrachii
Extensor ossis metacarpi pollicis and extensor primi internodii pollicis muscles (1)
Posterior interosseous artery
A. interossea dorsalis
Extensor communis digitorum muscle
M. extensor digitorum communis
Extensor minimi digiti muscle
M. extensor digiti V. proprius
Posterior interosseous nerve
Ramus profundus nervi radialis
1/1

(1) Mm. abductor longus et extensor brevis pollicis

FIG. 1029.—TRANSVERSE SECTION THROUGH THE RIGHT FOREARM, A LITTLE ABOVE THE MIDDLE OF ITS VERTICAL EXTENT (AT THE LEVEL OF THE INSERTION OF THE PRONATOR RADII TERES MUSCLE); UPPER SURFACE OF LOWER SEGMENT.


Anterior annular ligament of the wrist (superficial layer)[4]
Lig. carpi volare
Tendon of the flexor sublimis digitorum muscle[2]
Tendon of the flexor profundus digitorum muscle[3]
Tendon of the palmaris longus muscle
Median nerve—N. medianus
Flexor carpi ulnaris muscle
Tendon of the flexor carpi radialis muscle
Tendon of the flexor longus pollicis muscle
Ulnar artery—A. ulnaris
Superficial volar artery[5]
Ramus volaris superficialis
Ulnar nerve—N. ulnaris
Radial artery—A. radialis
Dorsal cutaneous branch of the ulnar nerve to the hand
Ramus dorsalis manus nervi ulnaris
Extensor ossis metacarpi pollicis muscle
M. abductor pollicis longus
Extensor primi internodii pollicis muscle
M. extensor pollicis brevis
Triangular fibrocartilage
Discus articularis
Radius
Head of the ulna—Capitulum ulnæ
Extensor carpi radialis longior muscle
Tendon of the extensor carpi ulnaris muscle
Extensor carpi radialis brevior muscle
Tendon of the extensor minimi digiti muscle
Tendo musculi extensoris digiti V. proprii
Extensor secundi internodii pollicis muscle (1)
Posterior annular ligament of the wrist
Lig. carpi dorsale
Tendons of the extensor communis digitorum and extensor indicis muscles
1/1

(1) M. extensor pollicis longus

FIG. 1030.—TRANSVERSE SECTION THROUGH THE DISTAL EXTREMITY OF THE RIGHT FOREARM, UPPER SURFACE OF LOWER SEGMENT.

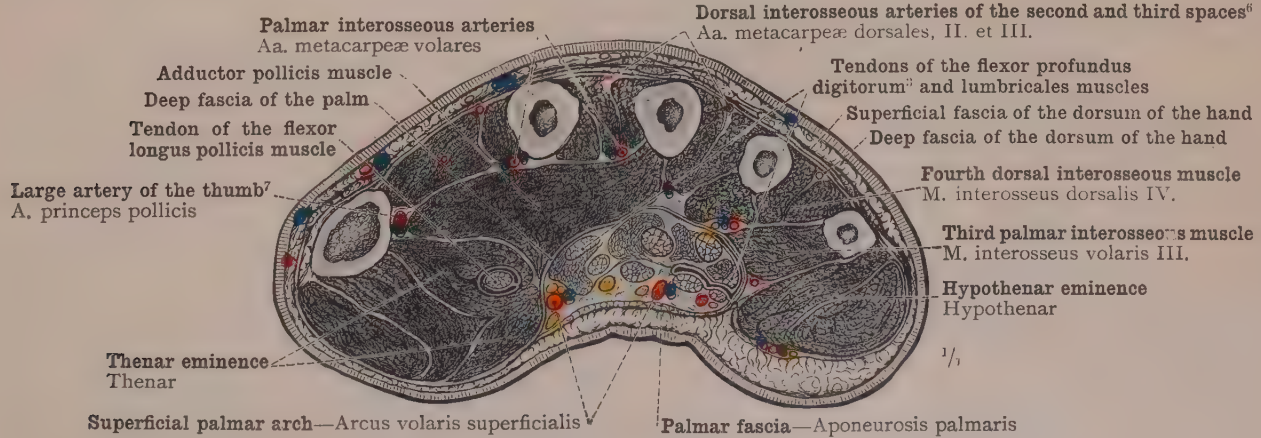
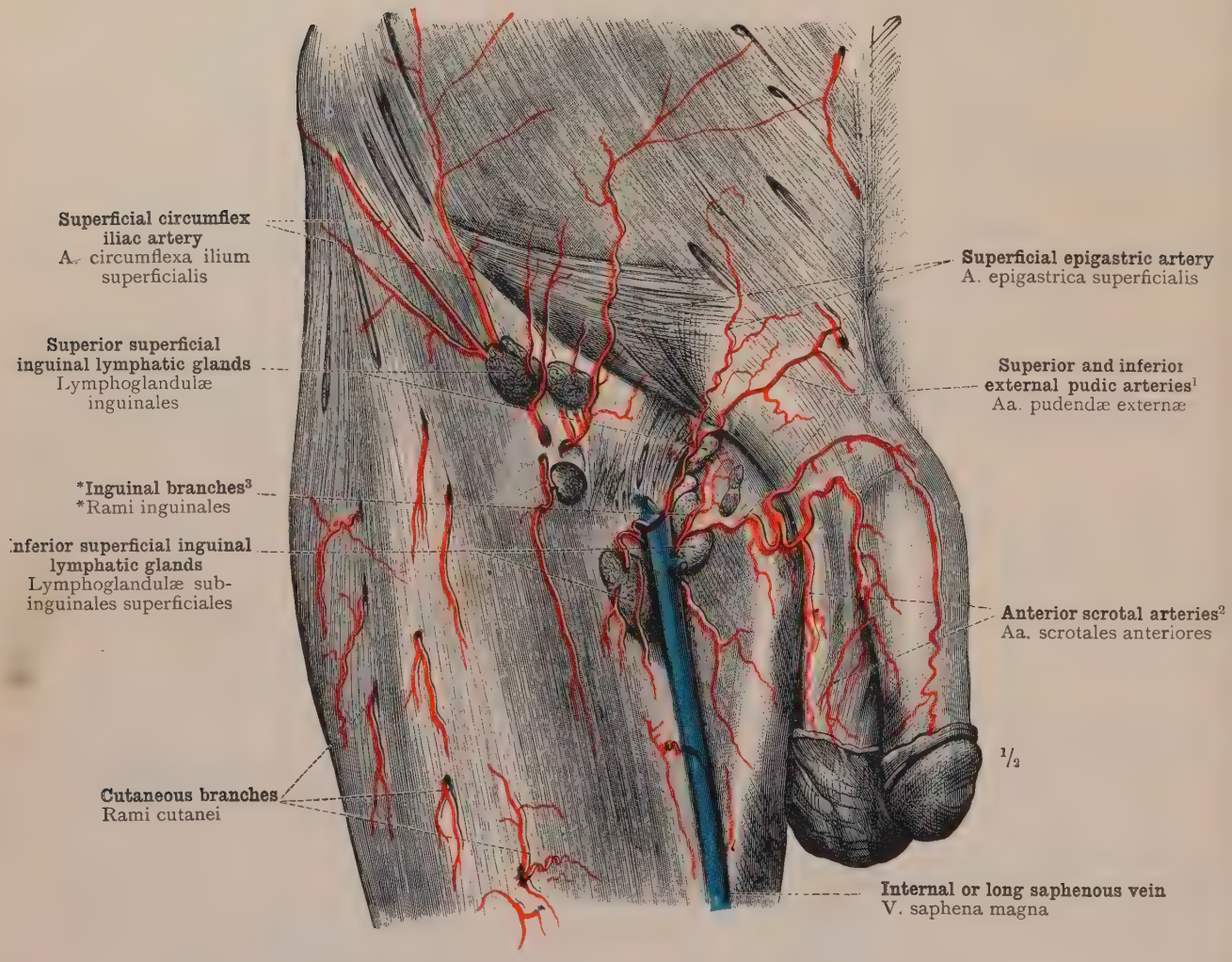

Palmar interosseous arteries
Aa. metacarpeæ volares
Dorsal interosseous arteries of the second and third spaces[6]
Aa. metacarpeæ dorsales, II. et III.
Adductor pollicis muscle
Tendons of the flexor profundus digitorum[3] and lumbricales muscles
Deep fascia of the palm
Superficial fascia of the dorsum of the hand
Tendon of the flexor longus pollicis muscle
Deep fascia of the dorsum of the hand
Fourth dorsal interosseous muscle
M. interosseus dorsalis IV.
Large artery of the thumb[7]
A. princeps pollicis
Third palmar interosseous muscle
M. interosseus volaris III.
Hypothenar eminence
Hypothenar
Thenar eminence
Thenar
1/1
Superficial palmar arch—Arcus volaris superficialis
Palmar fascia—Aponeurosis palmaris

FIG. 1031.—TRANSVERSE SECTION THROUGH THE RIGHT HAND, IMMEDIATELY BELOW THE BASES OF THE METACARPAL BONES; UPPER SURFACE OF LOWER SEGMENT.

[1] *Median Artery.*—Called by Macalister *comes nervi mediani artery.*
[2] Or *flexor perforatus* muscle.
[3] Or *flexor perforans* muscle.
[4] See Appendix, note [214].
[5] See note [2] to p. 632.
[6] See Appendix, note [222].
[7] See Appendix, note [218].
[8] See note [1] to p. 697.
[9] See note [2] to p. 697.



[1] The upper of these is named by Macalister the *superior* or *superficial pubic*, the lower, the *inferior pubic artery*.—Tr.

[2] See Appendix, note [138].

[3] *Rami Inguinales.*—According to Von Langer and Toldt (*op. cit.*, p. 525) there are **inguinal branches* of the *femoral artery*, to the skin and superficial lymphatic glands of this region, in addition to the four superficial branches of the femoral artery commonly enumerated, viz., *superficial epigastric*, *superficial circumflex iliac*, and *superior* and *inferior external pudic* arteries (see note [1] above). Quain does not mention independent inguinal branches, stating that the four superficial branches just enumerated all give small branches to the lymphatic glands in the groin. Macalister mentions an additional superficial branch of the femoral artery in Scarpa's triangle, the *saphenous*, "one, two, or three branches descending to the skin and lymphatic glands external to the saphena vein" (*op. cit.*, p. 486). These *saphenous* branches are in part identical with the *rami inguinales* of Toldt.—Tr.

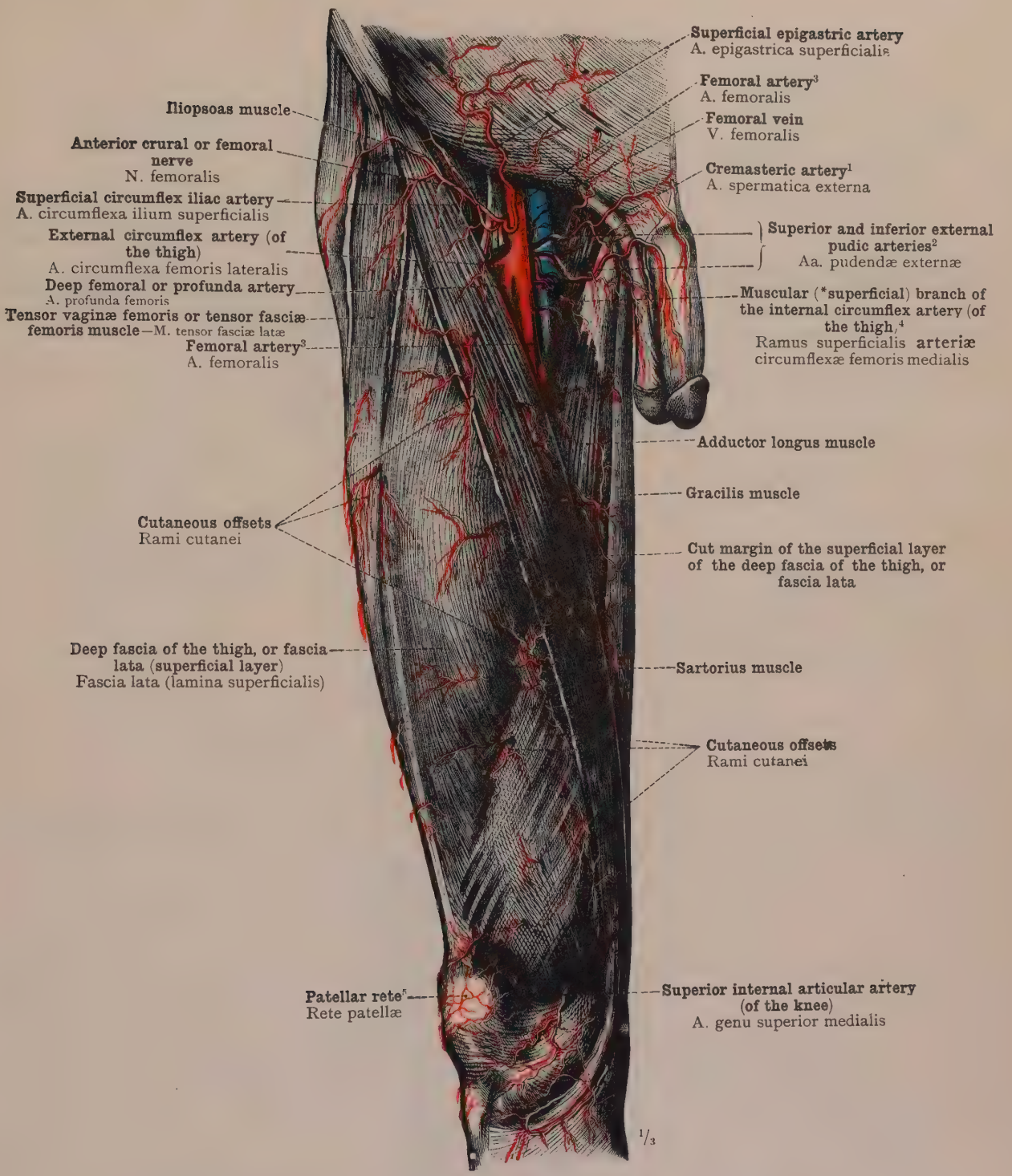
[4] Often called *femoral lymphatic glands*.

[5] *Subinguinal Fossa.*—"Immediately below Poupart's ligament, a slight hollow is generally seen, corresponding to Scarpa's triangular space, in which just internal to the centre, the femoral artery may be felt pulsating." (Quain, *op. cit.*, "Appendix on Superficial and Surgical Anatomy," p. 43). Though this author describes the hollow in question, he gives it no distinctive name, and I have therefore used a translation of Toldt's name of *fossa subinguinalis*.—Tr.

FIG. 1032.—THE SUBCUTANEOUS ARTERIES OF THE HYPOGASTRIC REGION (REGIO HYPOGASTRICA), THE INGUINAL REGION, THE MALE EXTERNAL GENERATIVE ORGANS, THE SUBINGUINAL FOSSA (*see note [5] above*) AND THE ADJOINING REGIONS OF THE RIGHT THIGH; THE SUPERIOR AND INFERIOR SUPERFICIAL INGUINAL LYMPHATIC GLANDS AND THE PROXIMAL PORTION OF THE INTERNAL OR LONG SAPHENOUS VEIN; SEEN FROM BEFORE.

The cribriform fascia (fascia cribrosa), the intercolumnar or spermatic fascia (fascia cremasterica Cooperi), and the deep fascia of the penis, have been left intact.

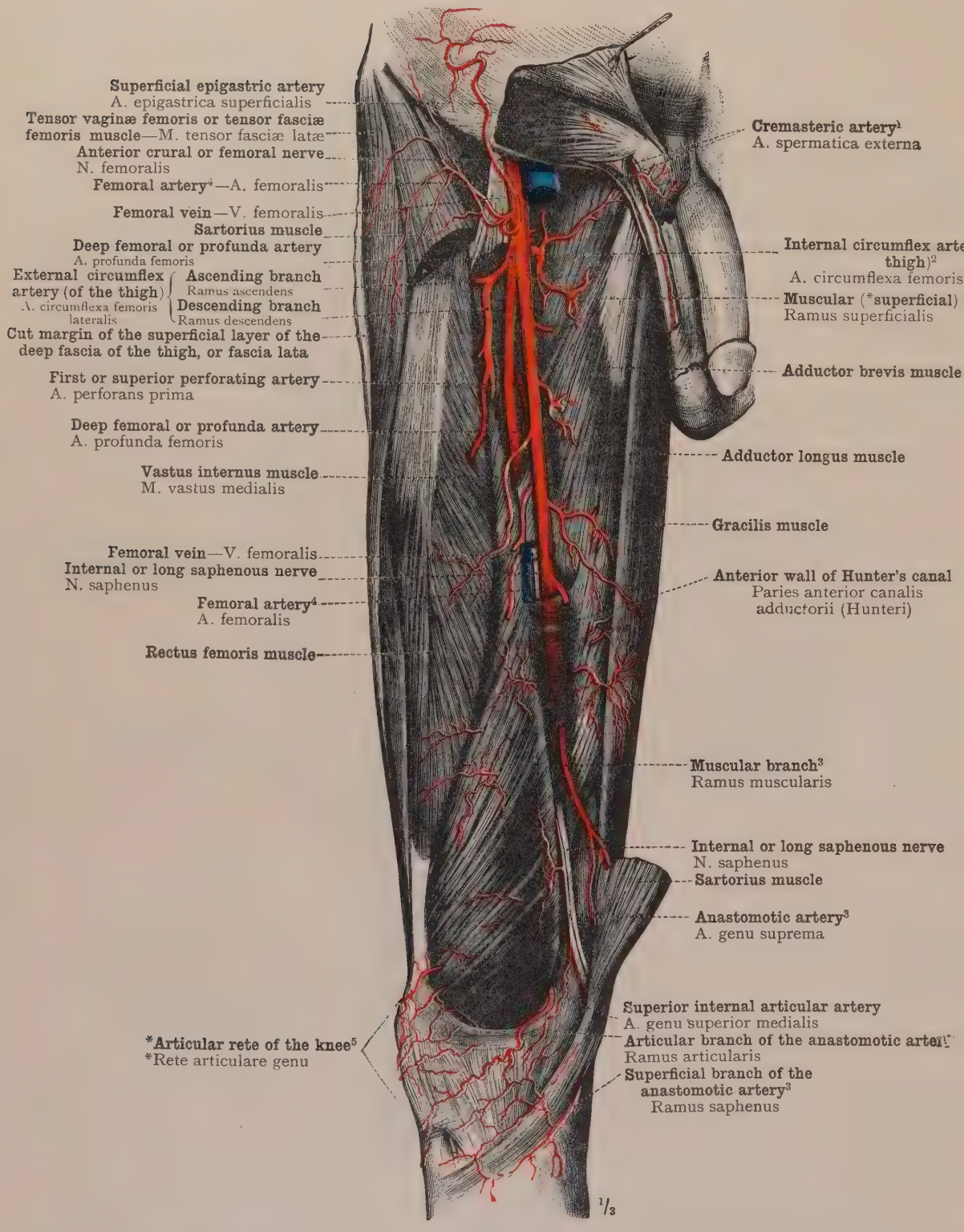
Arteries of the Front of the Thigh.


Superficial epigastric artery
A. epigastrica superficialis
Femoral artery[3]
A. femoralis
Femoral vein
V. femoralis
Cremasteric artery[1]
A. spermatica externa
Superior and inferior external pudic arteries[2]
Aa. pudendæ externæ
Muscular (*superficial) branch of the internal circumflex artery (of the thigh,[4]
Ramus superficialis arteriæ circumflexæ femoris medialis
Iliopsoas muscle
Anterior crural or femoral nerve
N. femoralis
Superficial circumflex iliac artery
A. circumflexa ilium superficialis
External circumflex artery (of the thigh)
A. circumflexa femoris lateralis
Deep femoral or profunda artery
A. profunda femoris
Tensor vaginæ femoris or tensor fasciæ femoris muscle—M. tensor fasciæ latæ
Femoral artery[3]
A. femoralis
Adductor longus muscle
Gracilis muscle
Cutaneous offsets
Rami cutanei
Cut margin of the superficial layer of the deep fascia of the thigh, or fascia lata
Deep fascia of the thigh, or fascia lata (superficial layer)
Fascia lata (lamina superficialis)
Sartorius muscle
Cutaneous offsets
Rami cutanei
Patellar rete[5]
Rete patellæ
Superior internal articular artery (of the knee)
A. genu superior medialis
1/3

[1] See Appendix, note [129].
[2] The upper of these is called by Macalister the *superior* or *superficial pubic*, the lower, the *inferior pubic artery*.—TR.
[3] See Appendix, note [223]. [4] See Appendix, note [224]. [5] See Appendix, note [225].

FIG. 1033.—THE TOPOGRAPHICAL ANATOMY OF SCARPA'S TRIANGLE (TRIGONUM FEMORALE *VEL* FOSSA SCARPÆ MAJOR) AND THE SUBCUTANEOUS ARTERIES OF THE ANTERIOR SURFACE OF THE RIGHT THIGH, THE REGION OF THE KNEE-JOINT, THE EXTERNAL GENERATIVE ORGANS, AND THE HYPOGASTRIC REGION (REGIO HYPOGASTRICA); SEEN FROM BEFORE.

The superficial layer of the deep fascia of the thigh, or fascia lata, has been removed in the region of Scarpa's triangle, and also from the surfaces of the sartorius, adductor longus, and tensor vaginæ femoris muscles.

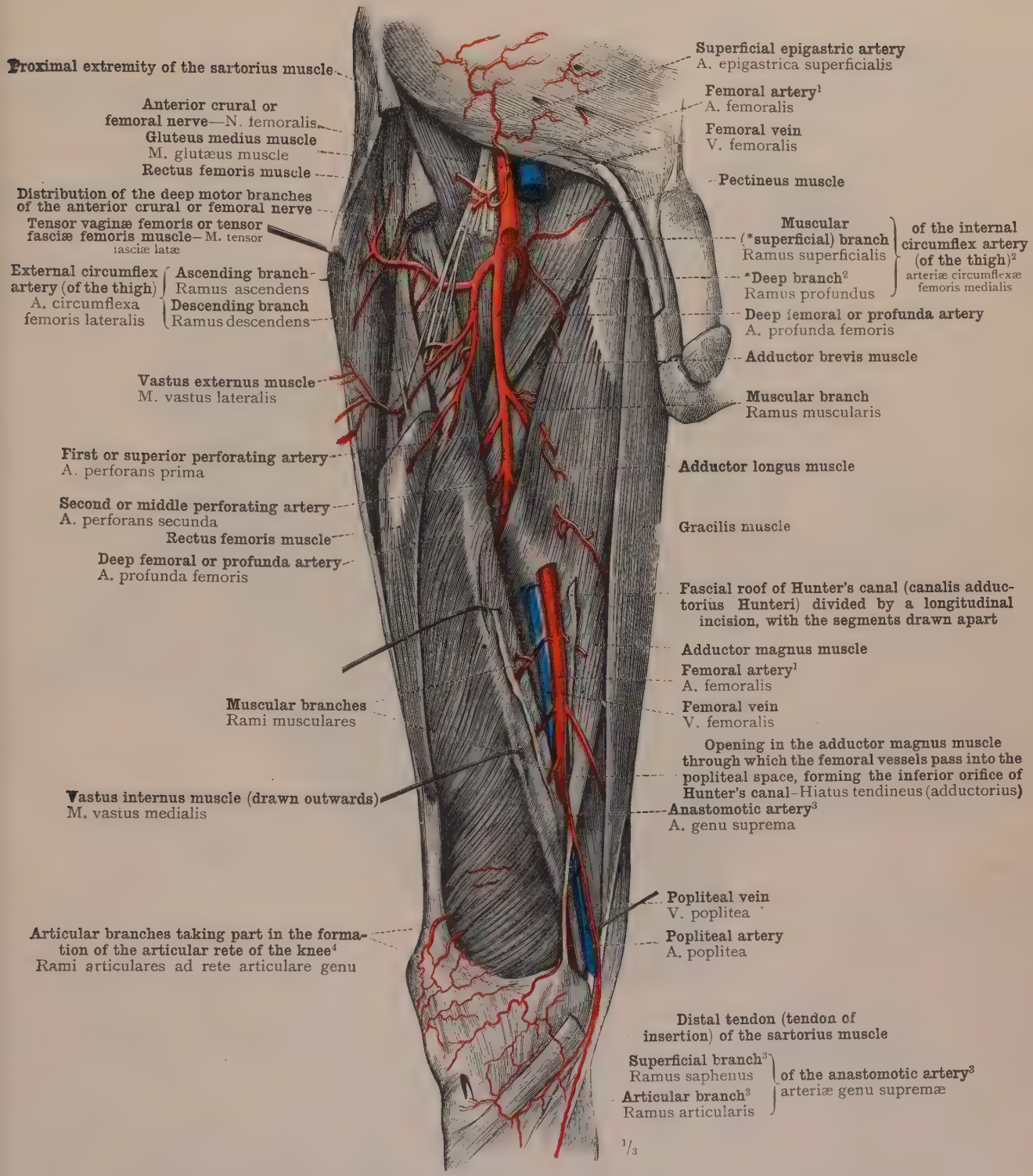


[1] See Appendix, note [129].
[2] See Appendix, note [224].
[3] See Appendix, note [226].
[4] See Appendix, note [223].
[5] See Appendix, note [227].

FIG. 1034.—THE FEMORAL ARTERY, ARTERIA FEMORALIS (*see Appendix, note* [223]), EXPOSED AS FAR AS ITS ENTRY INTO HUNTER'S CANAL (*see Appendix, note* [228]), AND THE DEEP FEMORAL OR PROFUNDA ARTERY, ARTERIA PROFUNDA FEMORIS.

The middle portion of the sartorius muscle has been cut away.

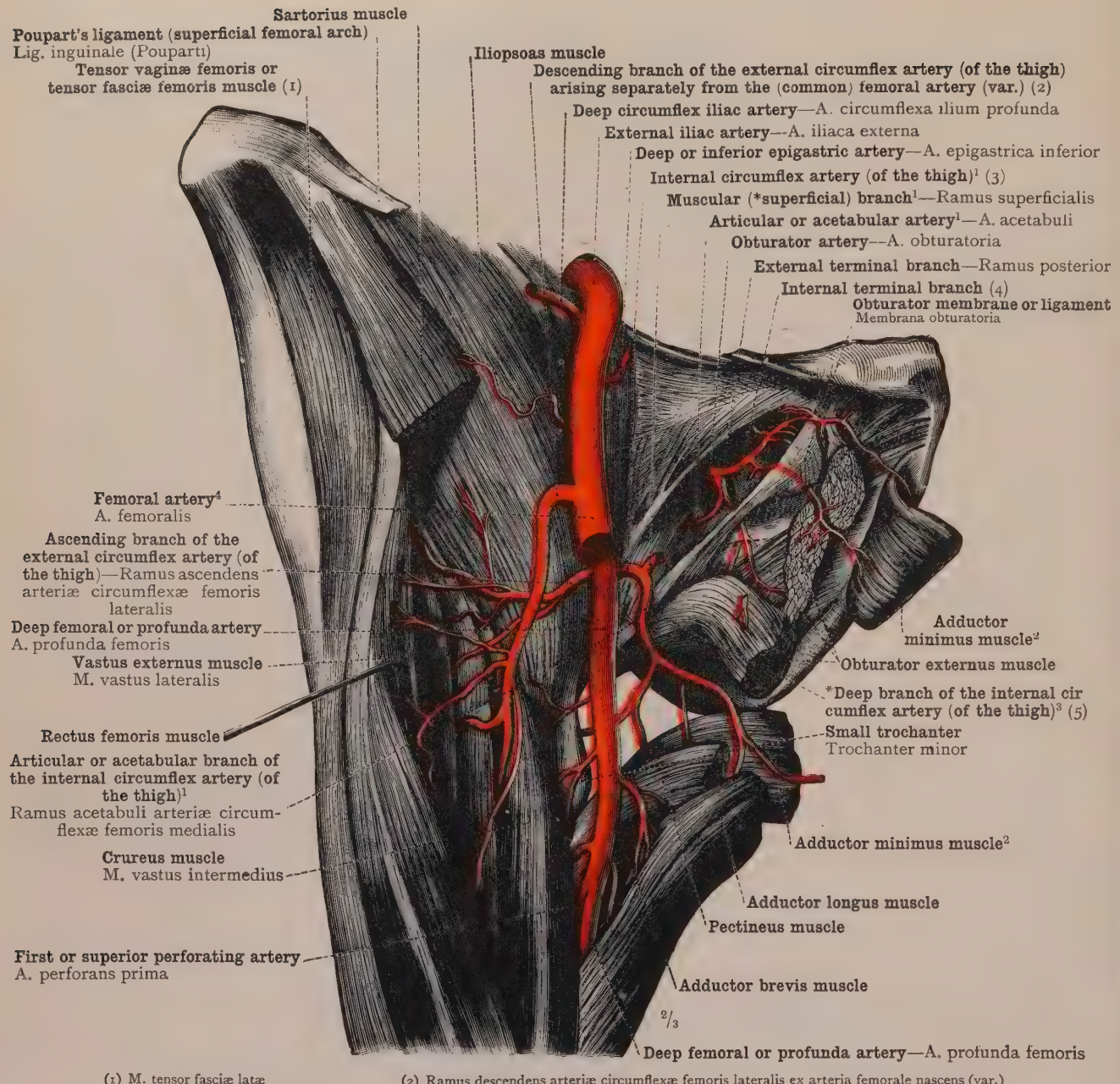
Arteries of the Front of the Thigh.


Proximal extremity of the sartorius muscle
Anterior crural or femoral nerve—N. femoralis
Gluteus medius muscle
M. glutæus muscle
Rectus femoris muscle
Distribution of the deep motor branches of the anterior crural or femoral nerve
Tensor vaginæ femoris or tensor fasciæ femoris muscle—M. tensor fasciæ latæ
External circumflex artery (of the thigh)
A. circumflexa femoris lateralis
Ascending branch
Ramus ascendens
Descending branch
Ramus descendens
Vastus externus muscle
M. vastus lateralis
First or superior perforating artery
A. perforans prima
Second or middle perforating artery
A. perforans secunda
Rectus femoris muscle
Deep femoral or profunda artery
A. profunda femoris
Muscular branches
Rami musculares
Vastus internus muscle (drawn outwards)
M. vastus medialis
Articular branches taking part in the formation of the articular rete of the knee[4]
Rami articulares ad rete articulare genu
Superficial epigastric artery
A. epigastrica superficialis
Femoral artery[1]
A. femoralis
Femoral vein
V. femoralis
Pectineus muscle
Muscular (*superficial) branch
Ramus superficialis
*Deep branch[2]
Ramus profundus
of the internal circumflex artery (of the thigh)[2]
arteriæ circumflexæ femoris medialis
Deep femoral or profunda artery
A. profunda femoris
Adductor brevis muscle
Muscular branch
Ramus muscularis
Adductor longus muscle
Gracilis muscle
Fascial roof of Hunter's canal (canalis adductorius Hunteri) divided by a longitudinal incision, with the segments drawn apart
Adductor magnus muscle
Femoral artery[1]
A. femoralis
Femoral vein
V. femoralis
Opening in the adductor magnus muscle through which the femoral vessels pass into the popliteal space, forming the inferior orifice of Hunter's canal–Hiatus tendineus (adductorius)
Anastomotic artery[3]
A. genu suprema
Popliteal vein
V. poplitea
Popliteal artery
A. poplitea
Distal tendon (tendon of insertion) of the sartorius muscle
Superficial branch[3]
Ramus saphenus
Articular branch[3]
Ramus articularis
of the anastomotic artery[3]
arteriæ genu supremæ
1/3

[1] See Appendix, note 223.
[2] *Ramus Profundus.*—The so-called **deep branch* of the *internal circumflex artery* is by English anatomists regarded as the continuation of that vessel itself. See Appendix, note 224.—Tr.
[3] See Appendix, note 226.
[4] See Appendix, note 227.

FIG. 1035.—THE DEEP FEMORAL OR PROFUNDA ARTERY, ARTERIA PROFUNDA FEMORIS, EXPOSED BY THE PARTIAL REMOVAL OF THE (SUPERFICIAL) FEMORAL ARTERY (*see Appendix, note* 223) ; THE (SUPERFICIAL) FEMORAL ARTERY AND VEIN, ARTERIA ET VENA FEMORALIS, IN HUNTER'S CANAL (CANALIS ADDUCTORIUS HUNTERI), THE FASCIAL ROOF OF WHICH HAS BEEN DIVIDED ; THE PASSAGE OF THE (SUPERFICIAL) FEMORAL VESSELS THROUGH THE OPENING IN THE ADDUCTOR MAGNUS MUSCLE (HIATUS TENDINEUS ADDUCTORIUS). SEEN FROM BEFORE.

Arteries of the Front of the Thigh.


Sartorius muscle
Poupart's ligament (superficial femoral arch)
Lig. inguinale (Pouparti)
Tensor vaginæ femoris or tensor fasciæ femoris muscle (1)
Iliopsoas muscle
Descending branch of the external circumflex artery (of the thigh) arising separately from the (common) femoral artery (var.) (2)
Deep circumflex iliac artery—A. circumflexa ilium profunda
External iliac artery—A. iliaca externa
Deep or inferior epigastric artery—A. epigastrica inferior
Internal circumflex artery (of the thigh)[1] (3)
Muscular (*superficial) branch[1]—Ramus superficialis
Articular or acetabular artery[1]—A. acetabuli
Obturator artery—A. obturatoria
External terminal branch—Ramus posterior
Internal terminal branch (4)
Obturator membrane or ligament
Membrana obturatoria
Femoral artery[4]
A. femoralis
Ascending branch of the external circumflex artery (of the thigh)—Ramus ascendens arteriæ circumflexæ femoris lateralis
Deep femoral or profunda artery
A. profunda femoris
Vastus externus muscle
M. vastus lateralis
Rectus femoris muscle
Articular or acetabular branch of the internal circumflex artery (of the thigh)[1]
Ramus acetabuli arteriæ circumflexæ femoris medialis
Crureus muscle
M. vastus intermedius
First or superior perforating artery
A. perforans prima
Adductor minimus muscle[2]
Obturator externus muscle
*Deep branch of the internal circumflex artery (of the thigh)[3] (5)
Small trochanter
Trochanter minor
Adductor minimus muscle[2]
Adductor longus muscle
Pectineus muscle
Adductor brevis muscle
2/3
Deep femoral or profunda artery—A. profunda femoris

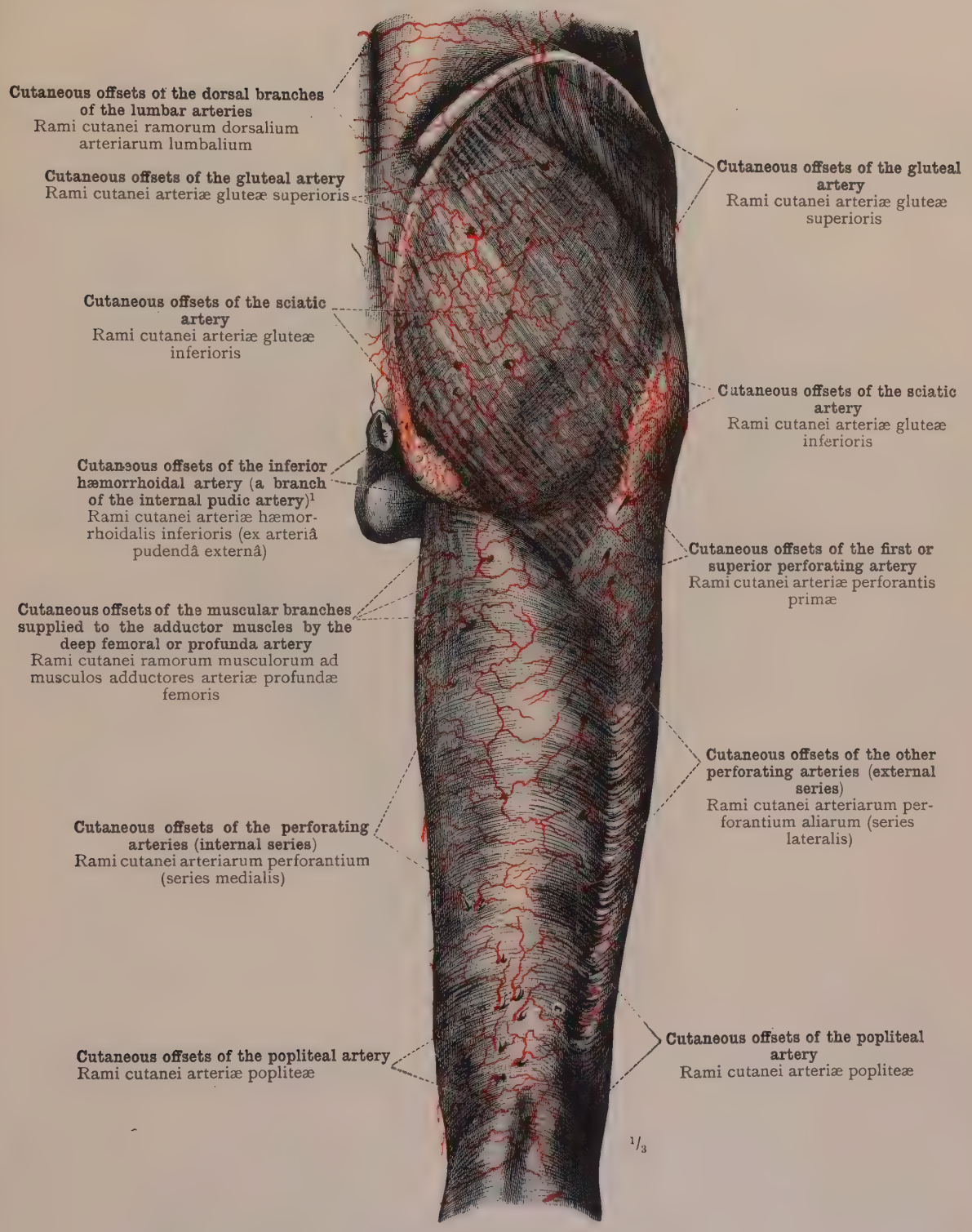
(1) M. tensor fasciæ latæ
(2) Ramus descendens arteriæ circumflexæ femoris lateralis ex arteria femorale nascens (var.)
(3) A. circumflexa femoris medialis
(4) Ramus anterior
(5) Ramus profundus arteriæ circumflexæ femoris medialis

[1] See Appendix, note [224].
[2] *Adductor Minimus Muscle.*—This, by English anatomists, is usually regarded, not as a separate muscle, but as the anterior and superior portion of the adductor magnus muscle. See note [2] to p. 345 in Part III. of this work.—Tr.
[3] See note [2] to p. 643 and Appendix, note [224].
[4] See Appendix note [223].

FIG. 1036.—THE RIGHT OBTURATOR ARTERY, ITS DIVISION INTO INTERNAL AND EXTERNAL TERMINAL BRANCHES, AND THE ORIGIN FROM THE LATTER OF THE ARTICULAR OR ACETABULAR ARTERY. THE DEEP FEMORAL OR PROFUNDA ARTERY, THE *DEEP BRANCH OF THE INTERNAL CIRCUMFLEX ARTERY (*see Appendix, note* [224]), AND ITS ARTICULAR OR ACETABULAR BRANCH, RAMUS ACETABULI. OF THE TWO PRINCIPAL BRANCHES OF THE EXTERNAL CIRCUMFLEX ARTERY, THE ASCENDING BRANCH ARISES IN THIS SPECIMEN FROM THE DEEP FEMORAL OR PROFUNDA ARTERY, BUT THE DESCENDING BRANCH ARISES FROM THE (COMMON) FEMORAL ARTERY (VAR.).

The sartorius muscle has been removed, except for the proximal extremity; the pectineus, adductor longus, and adductor brevis muscles have been divided transversely, the parts below the incision have been drawn inwards, and the proximal extremities have been cut away. The adductor magnus muscle has been entirely removed, the adductor minimus muscle (*see note* [2] *above*) has been divided transversely, and the segments have been drawn apart. The obturator externus muscle, which has been thus exposed, has been divided by an incision passing vertically downwards from its upper border, and the inner segment of the muscle has been turned downwards and inwards.

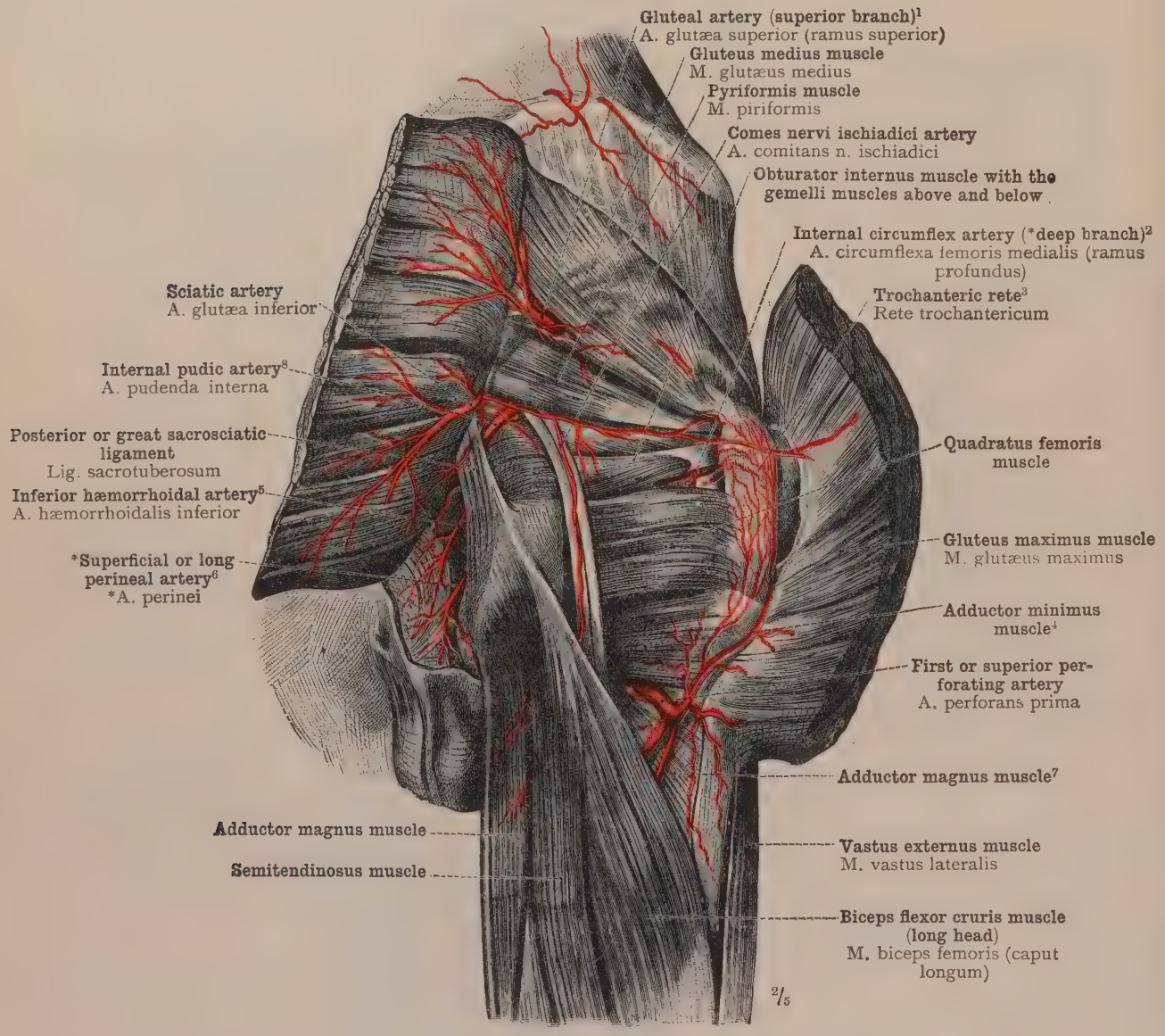
Arteries of the Front of the Thigh.


Cutaneous offsets of the dorsal branches of the lumbar arteries
Rami cutanei ramorum dorsalium arteriarum lumbalium
Cutaneous offsets of the gluteal artery
Rami cutanei arteriæ gluteæ superioris
Cutaneous offsets of the sciatic artery
Rami cutanei arteriæ gluteæ inferioris
Cutaneous offsets of the inferior hæmorrhoidal artery (a branch of the internal pudic artery)[1]
Rami cutanei arteriæ hæmorrhoidalis inferioris (ex arteriâ pudendâ externâ)
Cutaneous offsets of the muscular branches supplied to the adductor muscles by the deep femoral or profunda artery
Rami cutanei ramorum musculorum ad musculos adductores arteriæ profundæ femoris
Cutaneous offsets of the perforating arteries (internal series)
Rami cutanei arteriarum perforantium (series medialis)
Cutaneous offsets of the popliteal artery
Rami cutanei arteriæ popliteæ
Cutaneous offsets of the gluteal artery
Rami cutanei arteriæ gluteæ superioris
Cutaneous offsets of the sciatic artery
Rami cutanei arteriæ gluteæ inferioris
Cutaneous offsets of the first or superior perforating artery
Rami cutanei arteriæ perforantis primæ
Cutaneous offsets of the other perforating arteries (external series)
Rami cutanei arteriarum perforantium aliarum (series lateralis)
Cutaneous offsets of the popliteal artery
Rami cutanei arteriæ popliteæ
1/3

[1] *Inferior Hæmorrhoidal Artery.*—Quain gives *external hæmorrhoidal* as an alternative name for this vessel, while Macalister calls it the *anal* artery.

FIG. 1037.—THE CUTANEOUS ARTERIES OF THE BUTTOCK, THE BACK OF THE THIGH, AND THE HAM. RIGHT LOWER EXTREMITY, SEEN FROM BEHIND.

Arteries of the Buttock, the Back of the Thigh, and the Ham.

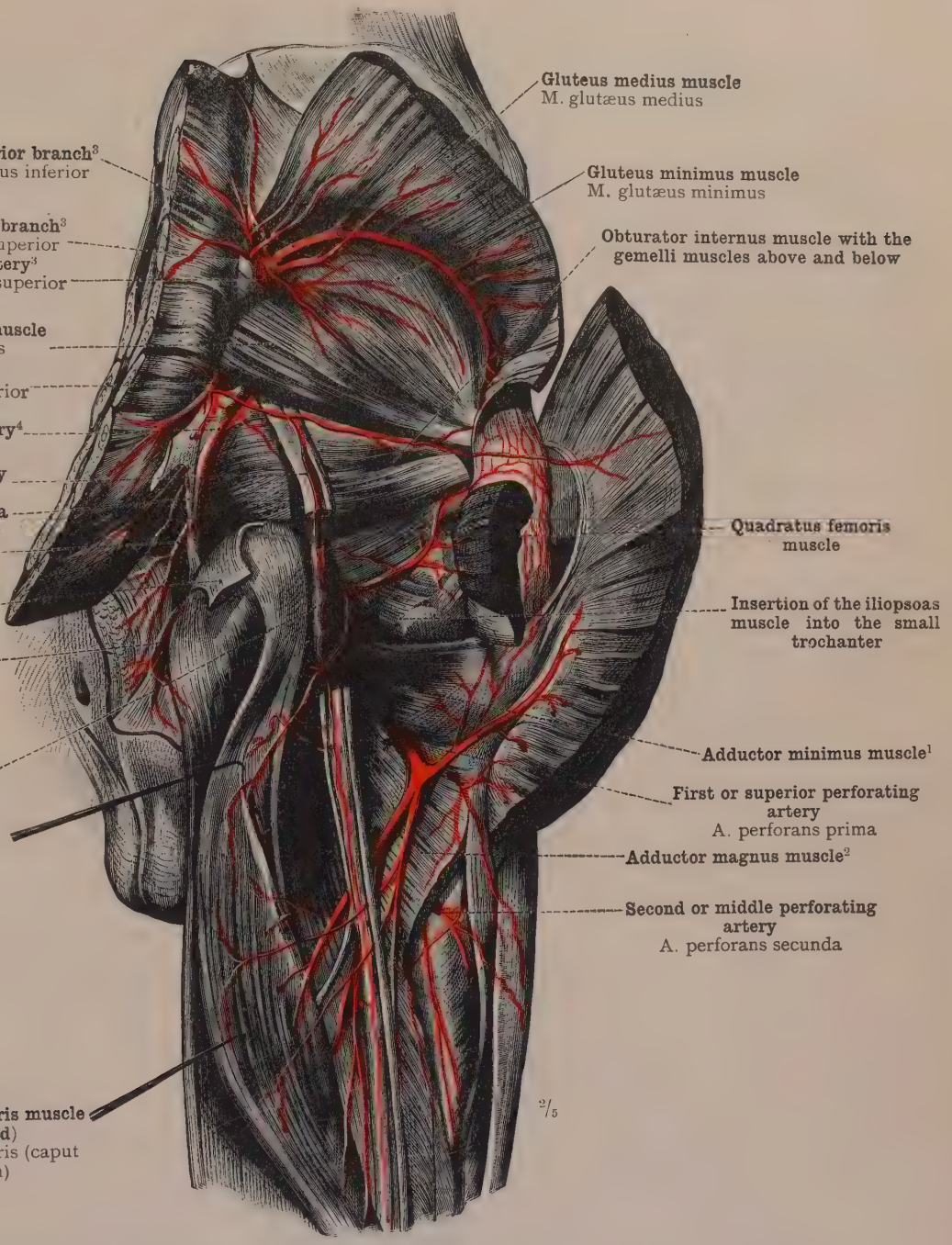


1 See Appendix, note 229. 2 See note 2 to p. 643 and Appendix, note 224. 3 See Appendix, note 230. 4 See note 2 to p. 644.
5 Quain gives *external hæmorrhoidal* as an alternative name for this vessel, while Macalister calls it the *anal artery*.
6 See Appendix, note 147. 7 See Appendix, note 231. 8 See Appendix, note 139.

FIG. 1038.—THE DEEP ARTERIES OF THE RIGHT BUTTOCK; SEEN FROM BEHIND. THE UPPER BRANCH, RAMUS SUPERIOR, OF THE DEEP PART OF THE GLUTEAL ARTERY, ARTERIA GLUTEA SUPERIOR; THE SCIATIC ARTERY, ARTERIA GLUTEA INFERIOR, AND THE COMES NERVI ISCHIADICI ARTERY, ARTERIA COMITANS NERVI ISCHIADICI; THE INTERNAL PUDIC ARTERY, ARTERIA PUDENDA INTERNA, FROM ITS EMERGENCE FROM THE PELVIS THROUGH THE GREAT SACROSCIATIC FORAMEN TO ITS ENTRY INTO THE ISCHIORECTAL FOSSA THROUGH THE SMALL SACROSCIATIC FORAMEN; THE INFERIOR OR EXTERNAL HÆMORRHOIDAL ARTERY (ANAL ARTERY), ARTERIA HÆMORRHOIDALIS INFERIOR, AND THE SUPERFICIAL OR LONG PERINEAL ARTERY, ARTERIA PERINEI. THE EMERGENCE OF THE FIRST OR SUPERIOR PERFORATING ARTERY, ARTERIA PERFORANS PRIMA, BETWEEN THE ADDUCTOR MINIMUS AND ADDUCTOR MAGNUS MUSCLES (*see note 2 to p.* 644), AND ITS DIVISION INTO ASCENDING AND DESCENDING BRANCHES; THE CRUCIAL ANASTOMOSIS AND THE TROCHANTERIC RETE, RETE TROCHANTERICUM.

The gluteus maximus muscle has been cut across a little above and internal to its middle, and the segments have been turned inwards and outwards, respectively.

Arteries of the Buttock.

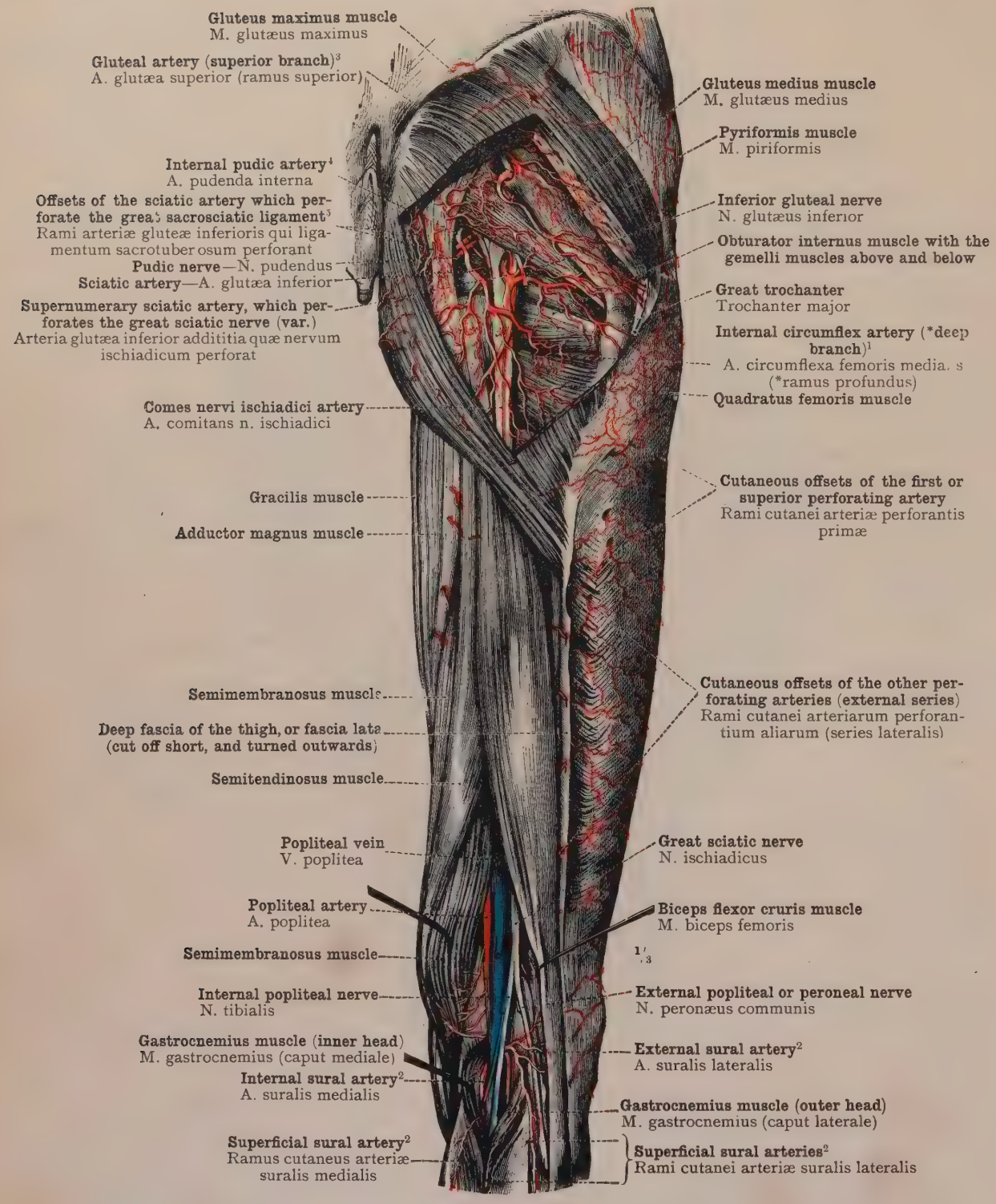


1 See note 2 to p. 644. 2 See Appendix, note 231. 3 See Appendix, note 229. 4 See Appendix, note 139.
5 Quain gives *external hæmorrhoidal* as an alternative name for this vessel, while M calister calls it the *anal artery*.
6 See note 2 to p. 643 and Appendix, note 224. 7 See Appendix, note 147.

FIG. 1039.—THE DEEP ARTERIES OF THE RIGHT BUTTOCK AND OF THE ADJOINING PORTION OF THE RIGHT THIGH.

In the preparation shown in Fig. 1037, the gluteus medius muscle was turned upwards, the posterior or great sacrosciatic ligament (ligamentum sacrotuberosum) was divided, and, after detaching it from the obturator fascia, its segments were drawn apart, in order to show the internal pudic artery (arteria pudenda interna) in the small sacrosciatic foramen. By the removal of parts of the great sciatic nerve and the quadratus femoris muscle, the internal circumflex artery and its branches (*ramus profundus arteriæ circumflexæ femoris medialis—*see Appendix, note* 224) were displayed beneath the obturator externus muscle. By the removal of part of the femoral attachment (insertion) of the adductor magnus muscle (*see Appendix, note* 231), the second or middle perforating artery was also displayed.

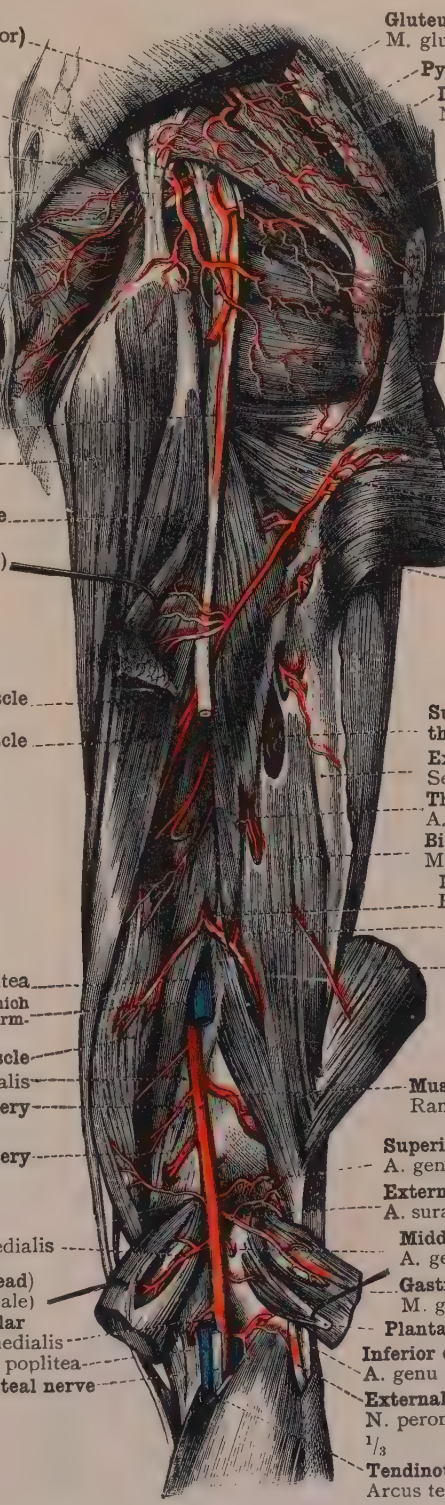
Arteries of the Buttock.


Gluteus maximus muscle
M. glutæus maximus
Gluteal artery (superior branch)[3]
A. glutæa superior (ramus superior)
Internal pudic artery[4]
A. pudenda interna
Offsets of the sciatic artery which perforate the great sacrosciatic ligament[5]
Rami arteriæ gluteæ inferioris qui ligamentum sacrotuberosum perforant
Pudic nerve—N. pudendus
Sciatic artery—A. glutæa inferior
Supernumerary sciatic artery, which perforates the great sciatic nerve (var.)
Arteria glutæa inferior addititia quæ nervum ischiadicum perforat
Comes nervi ischiadici artery
A. comitans n. ischiadici
Gracilis muscle
Adductor magnus muscle
Semimembranosus muscle
Deep fascia of the thigh, or fascia lata (cut off short, and turned outwards)
Semitendinosus muscle
Popliteal vein
V. poplitea
Popliteal artery
A. poplitea
Semimembranosus muscle
Internal popliteal nerve
N. tibialis
Gastrocnemius muscle (inner head)
M. gastrocnemius (caput mediale)
Internal sural artery[2]
A. suralis medialis
Superficial sural artery[2]
Ramus cutaneus arteriæ suralis medialis
Gluteus medius muscle
M. glutæus medius
Pyriformis muscle
M. piriformis
Inferior gluteal nerve
N. glutæus inferior
Obturator internus muscle with the gemelli muscles above and below
Great trochanter
Trochanter major
Internal circumflex artery (*deep branch)[1]
A. circumflexa femoris media. s (*ramus profundus)
Quadratus femoris muscle
Cutaneous offsets of the first or superior perforating artery
Rami cutanei arteriæ perforantis primæ
Cutaneous offsets of the other perforating arteries (external series)
Rami cutanei arteriarum perforantium aliarum (series lateralis)
Great sciatic nerve
N. ischiadicus
Biceps flexor cruris muscle
M. biceps femoris
External popliteal or peroneal nerve
N. peronæus communis
External sural artery[2]
A. suralis lateralis
Gastrocnemius muscle (outer head)
M. gastrocnemius (caput laterale)
Superficial sural arteries[2]
Rami cutanei arteriæ suralis lateralis

[1] See note [2] to p. 643 and Appendix, note [224]. [2] See Appendix, note [232]. [3] See Appendix, note [229]. [4] See Appendix, note [139].
[5] One of these branches, which has an inward course after perforating the great sacrosciatic ligament, is distinguished by English anatomists as the *coccygeal branch* of the *sciatic artery*.—Tr.

FIG. 1040.—TOPOGRAPHICAL ANATOMY OF THE BUTTOCK AND THE HAM; THE CUTANEOUS ARTERIES OF THE POSTERO-EXTERNAL PART OF THE RIGHT THIGH; SEEN FROM BEHIND.

Arteries of the Buttock, the Back of the Thigh, and the Ham.



Gluteal artery (superior branch)[7]
A. glutæa superior (ramus superior)

Sciatic artery
A. glutæa inferior

Internal pudic artery[8]—A. pudenda interna

Posterior or great sacrosciatic ligament
Lig. sacrotuberosum

Inferior hæmorrhoidal artery[9]
A. hæmorrhoidalis inferior

Comes nervi ischiadici artery—A. comitans n. ischiadici

Adductor magnus muscle

Semitendinosus muscle

Biceps flexor cruris muscle (long head)
M. biceps femoris (caput longum)

Semitendinosus muscle

Adductor magnus muscle

Popliteal vein—V. poplitea

Opening in the adductor magnus muscle through which the femoral vessels pass into the popliteal space, forming the inferior orifice of Hunter's canal (1)

Semimembranosus muscle

Vastus internus muscle—M. vastus medialis

Popliteal artery
A. poplitea

Superior internal articular artery
A. genu superior medialis

Internal sural artery[6]—A. suralis medialis

Gastrocnemius muscle (inner head)
M. gastrocnemius (caput mediale)

Inferior internal articular artery—A. genu inferior medialis

Popliteal vein—V. poplitea

Internal popliteal nerve
N. tibialis

(1) Hiatus tendineus (adductorius)

Gluteus medius muscle
M. glutæus medius

Pyriformis muscle—M. piriformis

Inferior gluteal nerve
N. glutæus inferior

Obturator internus muscle, with the gemellus superior muscle above and the gemellus inferior muscle below

Trochanteric rete[1]
Rete trochantericum

Internal circumflex artery (of the thigh):
***deep branch**[2]—A. circumflexa femoris medialis (*ramus profundus)

Quadratus femoris muscle

Offset of the first or superior perforating artery—Ramus arteriæ perforantis primæ

Gluteus maximus muscle
M. glutæus maximus

Adductor minimus muscle[3]

First or superior perforating artery
A. perforans prima

Superior medullary or nutritious artery of the femur[4]—A. nutricia femoris superior

External intermuscular septum (of the thigh)
Septum intermusculare (femoris) laterale

Third or inferior perforating artery
A. perforans tertia

Biceps flexor cruris muscle (short head)
M. biceps femoris (caput breve)

Muscular branch of the femoral artery[5]
Ramus muscularis arteriæ femoralis

Inferior medullary or nutritious artery of the femur[4]—A. nutricia femoris inferior

Biceps flexor cruris muscle (long head)
M. biceps femoris (caput longum)

Muscular branch
Ramus muscularis

Superior external articular artery
A. genu superior lateralis

External sural artery[6]
A. suralis lateralis

Middle or azygos articular artery
A. genu media

Gastrocnemius muscle (outer head)
M. gastrocnemius (caput laterale)

Plantaris muscle

Inferior external articular artery
A. genu inferior lateralis

External popliteal, or peroneal, nerve
N. peronæus communis

Tendinous arch of the soleus muscle[11]
Arcus tendineus m. solei

FIG. 1041.—THE DEEP ARTERIES OF THE BUTTOCK; THE PERFORATING ARTERIES, ARTERIÆ PERFORANTES; THE POPLITEAL ARTERY, ARTERIA POPLITEA, FROM THE OPENING IN THE ADDUCTOR MAGNUS MUSCLE TO THE ENTRY OF THE ARTERY INTO THE *POPLITEAL CANAL, *CANALIS POPLITEUS[10]; THE MUSCULAR AND ARTICULAR BRANCHES OF THE POPLITEAL ARTERY; SEEN FROM BEHIND.

1 See Appendix, note [230]. 2 See note [2] to p. 643 and Appendix, note [224]. 3 See note [2] to p. 644. 4 See Appendix, note [233].
5 See Appendix, note [223]. 6 See Appendix, note [232]. 7 See Appendix, note [229]. 8 See Appendix, note [139].
9 Quain gives *external hæmorrhoidal* as an alternative name for this vessel, while Macalister calls it the *anal artery*.
10 See Appendix, note [234]. 11 See note [7] to p. 363 in Part III.

Arteries of the Buttock, the Back of the Thigh, and the Ham.

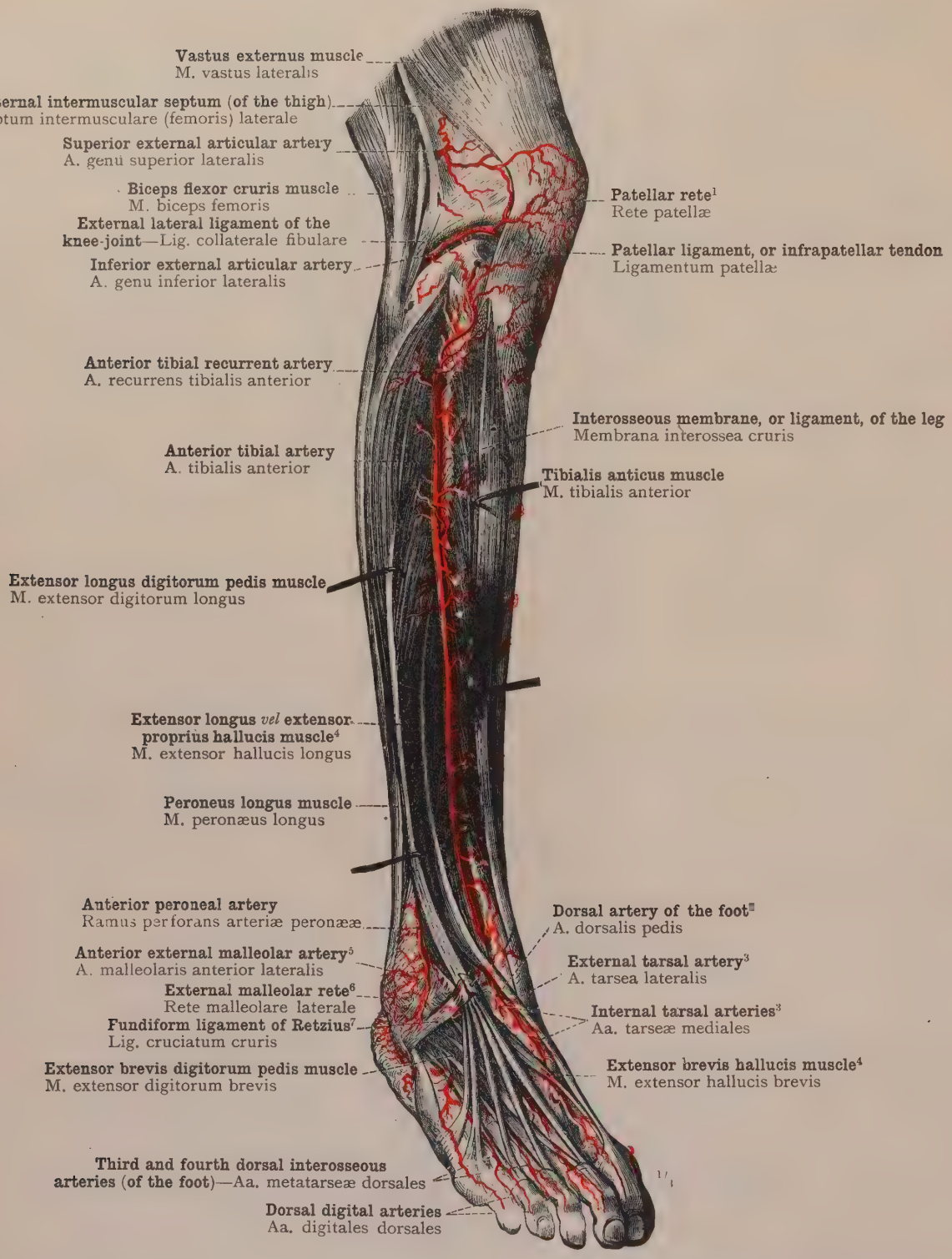
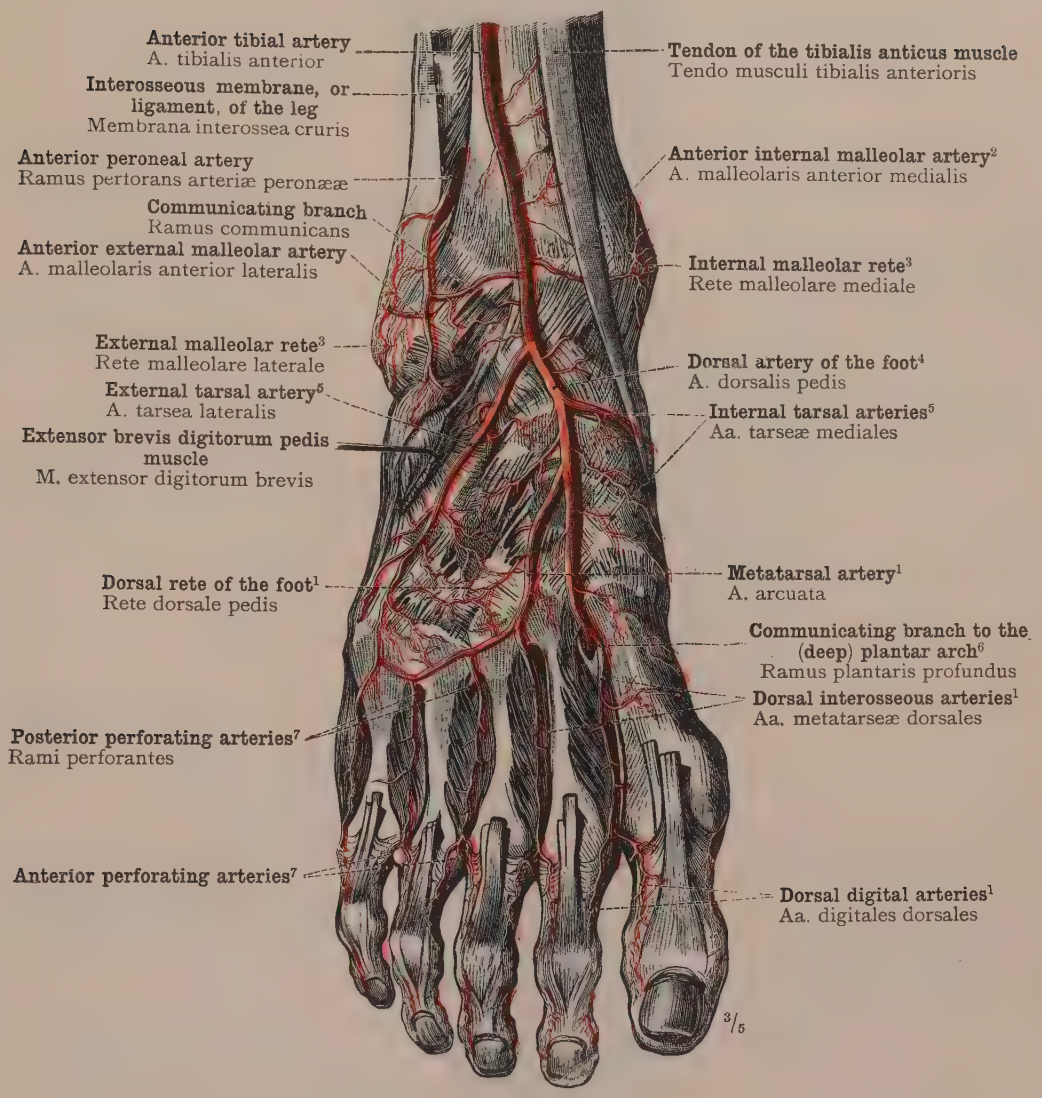


FIG. 1042.—THE ANTERIOR TIBIAL ARTERY AND ITS CONTINUATION INTO THE DORSAL ARTERY OF THE FOOT, OR DORSALIS PEDIS ARTERY.

The tibialis anticus and the extensor longus digitorum pedis muscles have been drawn apart, and the uppermost part of the former has been cut away. The anterior annular ligament of the ankle has been divided by a longitudinal incision, and its outer limb (fundiform ligament of Retzius[7]) has been raised from the subjacent tendons of the extensor longus digitorum pedis and peroneus tertius muscles.

1 See Appendix, note 227. 2 Often known in England by its Latin name of *dorsalis pedis artery*. 3 See Appendix, note 235.
4 See note 2 to p. 364 in Part III. 5 See Appendix, note 236. 6 See Appendix, note 237. 7 See Appendix, note 238.

Arteries of the Front of the Leg and the Dorsum of the Foot.

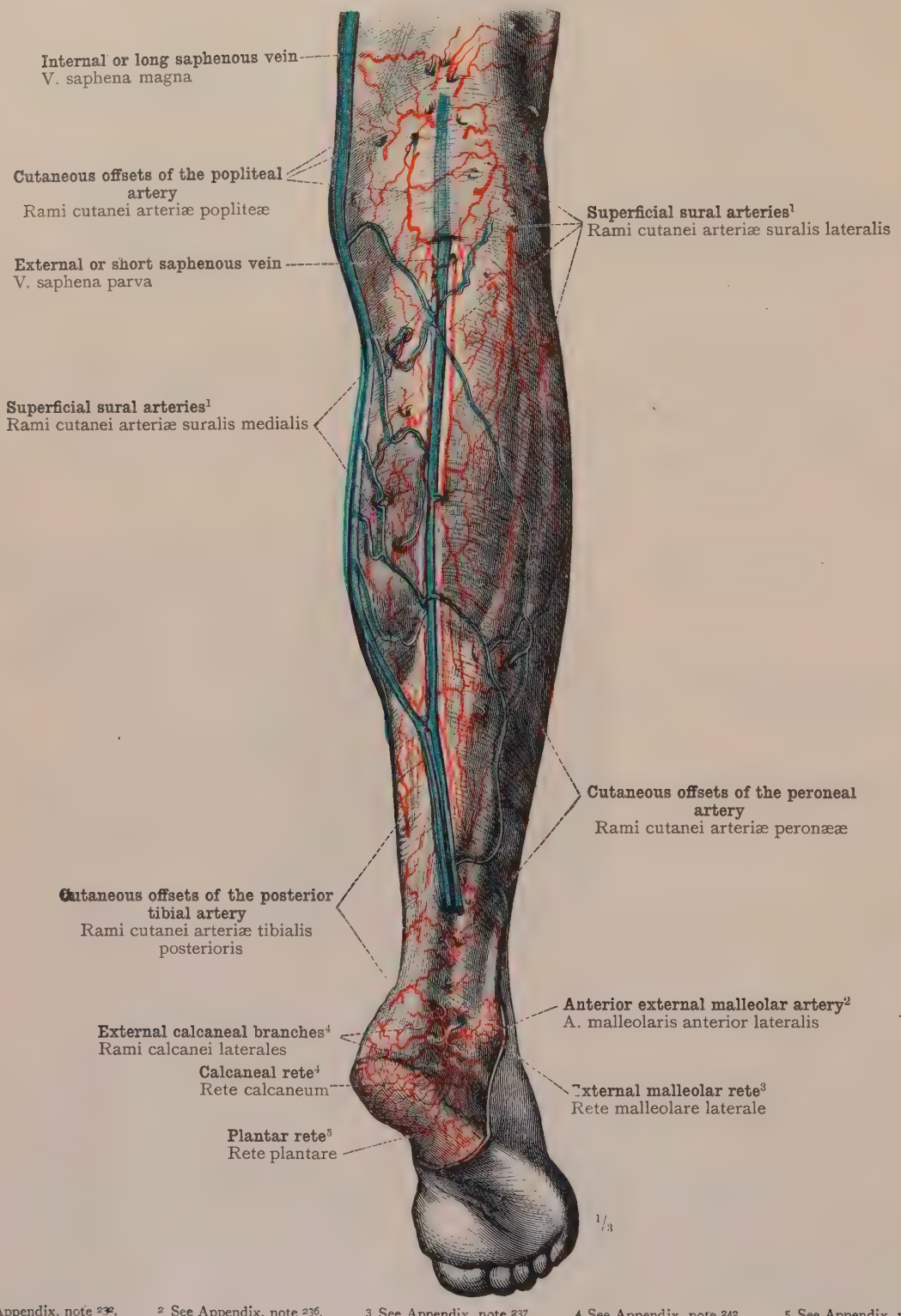


[1] See Appendix, note [239]. [2] See Appendix, note [236]. [3] See Appendix, note [237].
[4] Often known in England by its Latin name of *dorsalis pedis artery*. [5] See Appendix, note [235].
[6] See Appendix, note [240]. [7] See Appendix, note [241].

FIG. 1043.—THE DISTAL EXTREMITY OF THE ANTERIOR TIBIAL ARTERY, ITS COMMUNICATION WITH THE ANTERIOR PERONEAL ARTERY (RAMUS PERFORANS ARTERIÆ PERONÆÆ) AND ITS CONTINUATION INTO THE DORSAL ARTERY OF THE FOOT (ARTERIA DORSALIS PEDIS); THE ANTERIOR EXTERNAL AND ANTERIOR INTERNAL MALLEOLAR ARTERIES (ARTERIÆ MALLEOLARES ANTERIORES, MEDIALIS ET LATERALIS); THE EXTERNAL AND INTERNAL MALLEOLAR RETIA; THE EXTERNAL TARSAL ARTERY (ARTERIA TARSEA LATERALIS) AND THE INTERNAL TARSAL ARTERIES (ARTERIÆ TARSEÆ MEDIALES); THE METATARSAL ARTERY (ARTERIA ARCUATA); THE DORSAL ARTERIAL RETE OF THE FOOT; THE COMMUNICATING BRANCH OF THE DORSAL ARTERY OF THE FOOT TO THE DEEP PLANTAR ARCH OR FIRST POSTERIOR PERFORATING ARTERY (RAMUS PLANTARIS PROFUNDUS ARTERIÆ DORSALIS PEDIS—*see Appendix, note* [240]); THE DORSAL INTEROSSEOUS ARTERIES (ARTERIÆ METATARSEÆ DORSALES), AND THEIR CONNEXIONS WITH THE POSTERIOR PERFORATING OFFSETS (RAMI PERFORANTES) OF THE DEEP PLANTAR ARCH; THE DORSAL DIGITAL ARTERIES (ARTERIÆ DIGITALES DORSALES), AND THEIR ANASTOMOSES WITH THE PLANTAR DIGITAL ARTERIES (THESE ANASTOMOSES BEING THE ANTERIOR PERFORATING ARTERIES OF ENGLISH ANATOMISTS—*see Appendix, note* [241]). THE RIGHT FOOT WITH THE DISTAL EXTREMITY OF THE LEG; SEEN FROM THE DORSAL SIDE.

The extensor muscles of the toes were removed as far down as the heads of the metatarsal bones and the peroneus tertius muscle was cut completely away, in order to lay bare the arteries on the dorsum of the foot.

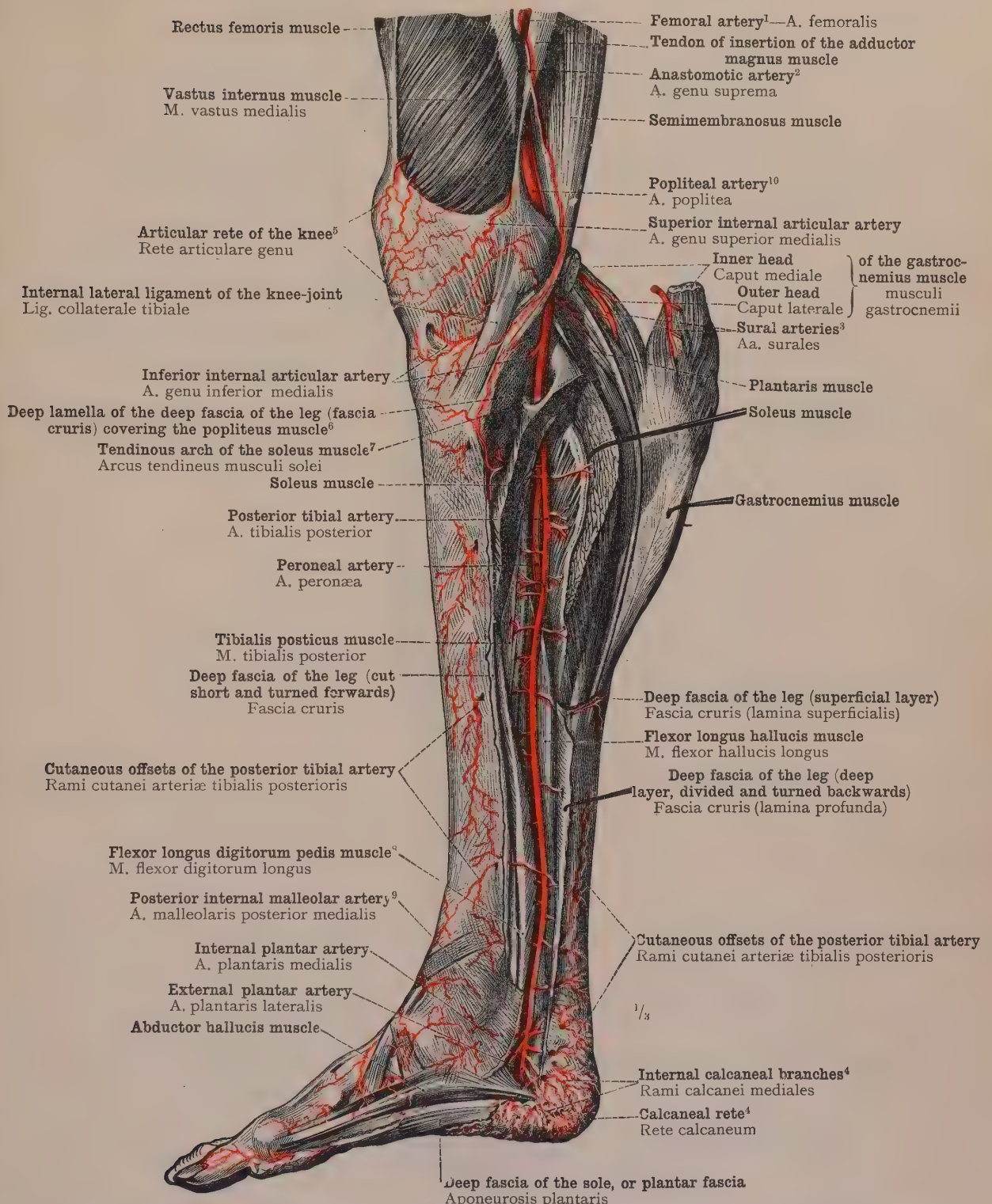
Arteries of the Dorsum of the Foot.



1 See Appendix, note 232. 2 See Appendix, note 236. 3 See Appendix, note 237. 4 See Appendix, note 242. 5 See Appendix, note 243.

FIG. 1044.—THE SUBCUTANEOUS ARTERIES OF THE CALF AND OF THE POPLITEAL REGION IN ADDITION TO PORTIONS OF THE INTERNAL OR LONG AND THE EXTERNAL OR SHORT SAPHENOUS VEINS (VENA SAPHENA MAGNA ET VENA SAPHENA PARVA); THE CALCANEAL AND MALLEOLAR RETIA; THE POSTERIOR PORTION OF THE PLANTAR RETE. RIGHT LEG AND FOOT; SEEN FROM BEHIND AND THE OUTER SIDE

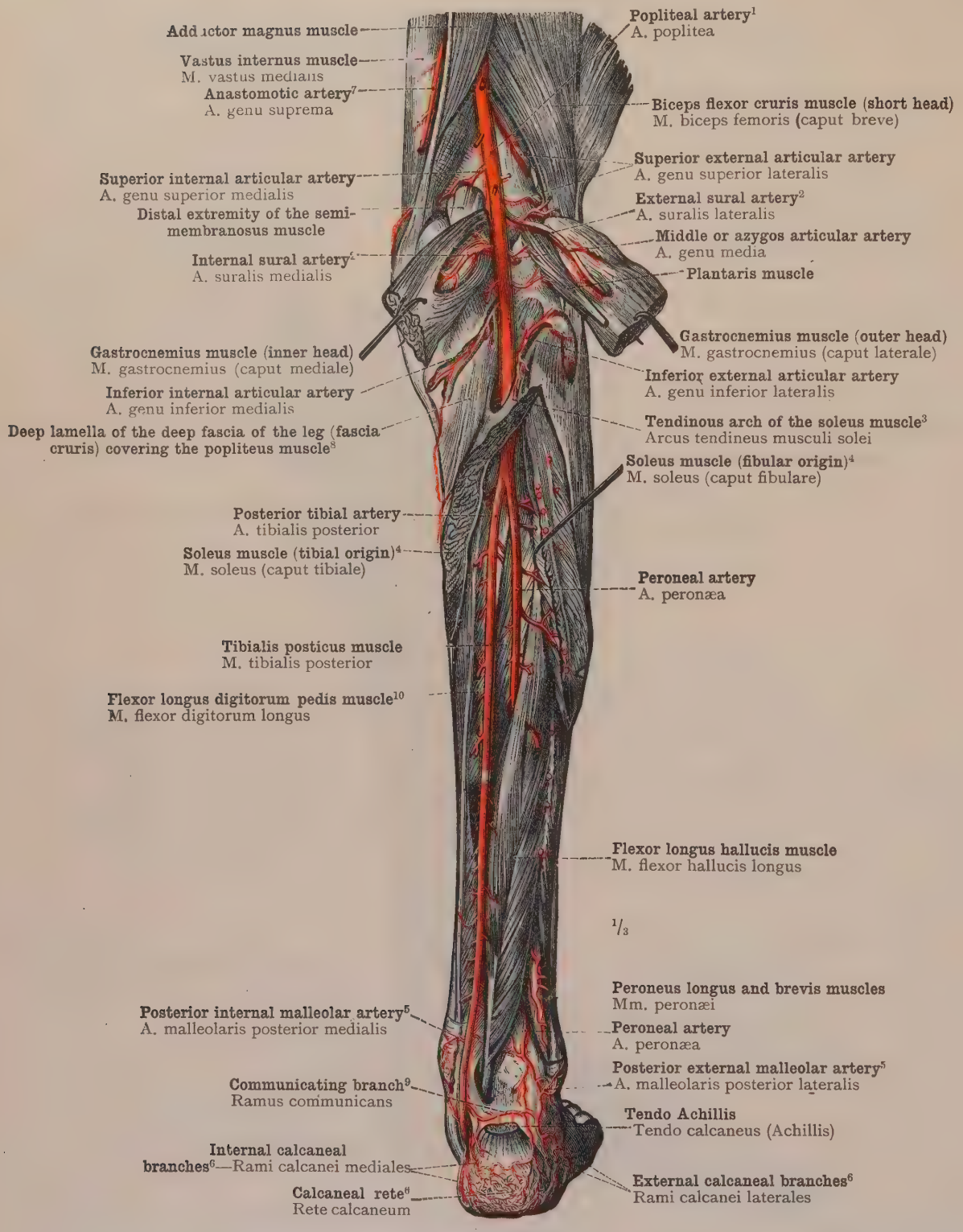
Arteries of the Back of the Leg.



1 See Appendix, note 223.
2 See Appendix, note 226.
3 See Appendix, note 232.
4 See Appendix, note 242.
5 See note 5 to p. 642.
6 See Appendix, note 244.
7 See note 7 to p. 363 in Part III.
8 Or *flexor perforans* muscle.
9 See Appendix, note 236.
10 See Appendix, note 245.

FIG. 1045.—THE POPLITEAL ARTERY, ITS PASSAGE THROUGH THE *POPLITEAL CANAL (*see Appendix, note* [245]), AND THE POSTERIOR TIBIAL ARTERY.

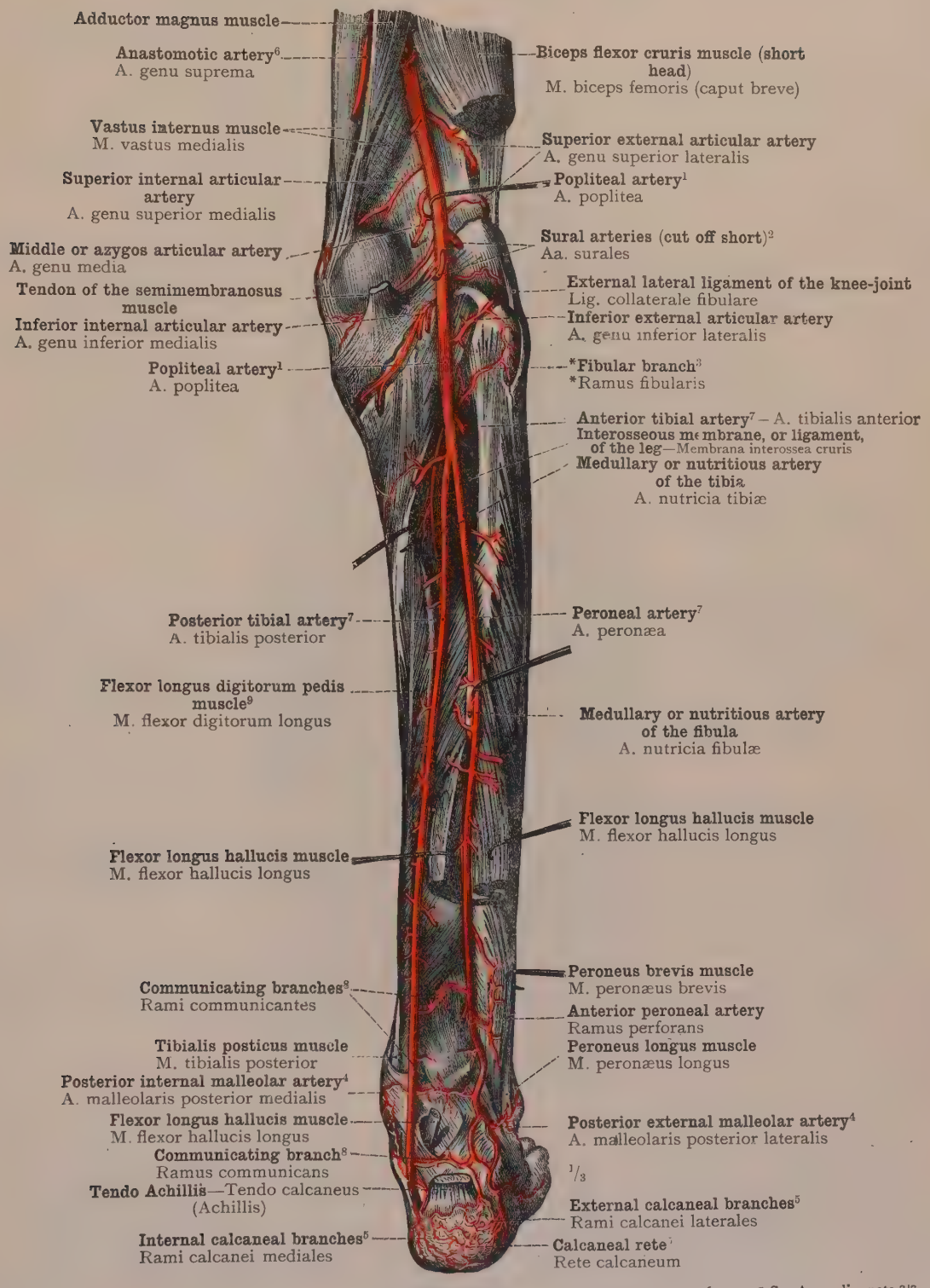
Arteries of the Back of the Leg.



1 See Appendix, note 245. 2 See Appendix, note 232. 3 See note 7 to p. 363 in Part III. 4 See Appendix, note 246. 5 See Appendix, note 236.
6 See Appendix, note 242. 7 See Appendix, note 226. 8 See Appendix, note 244. 9 See Appendix, note 247. 10 Or *flexor perforans* muscle.

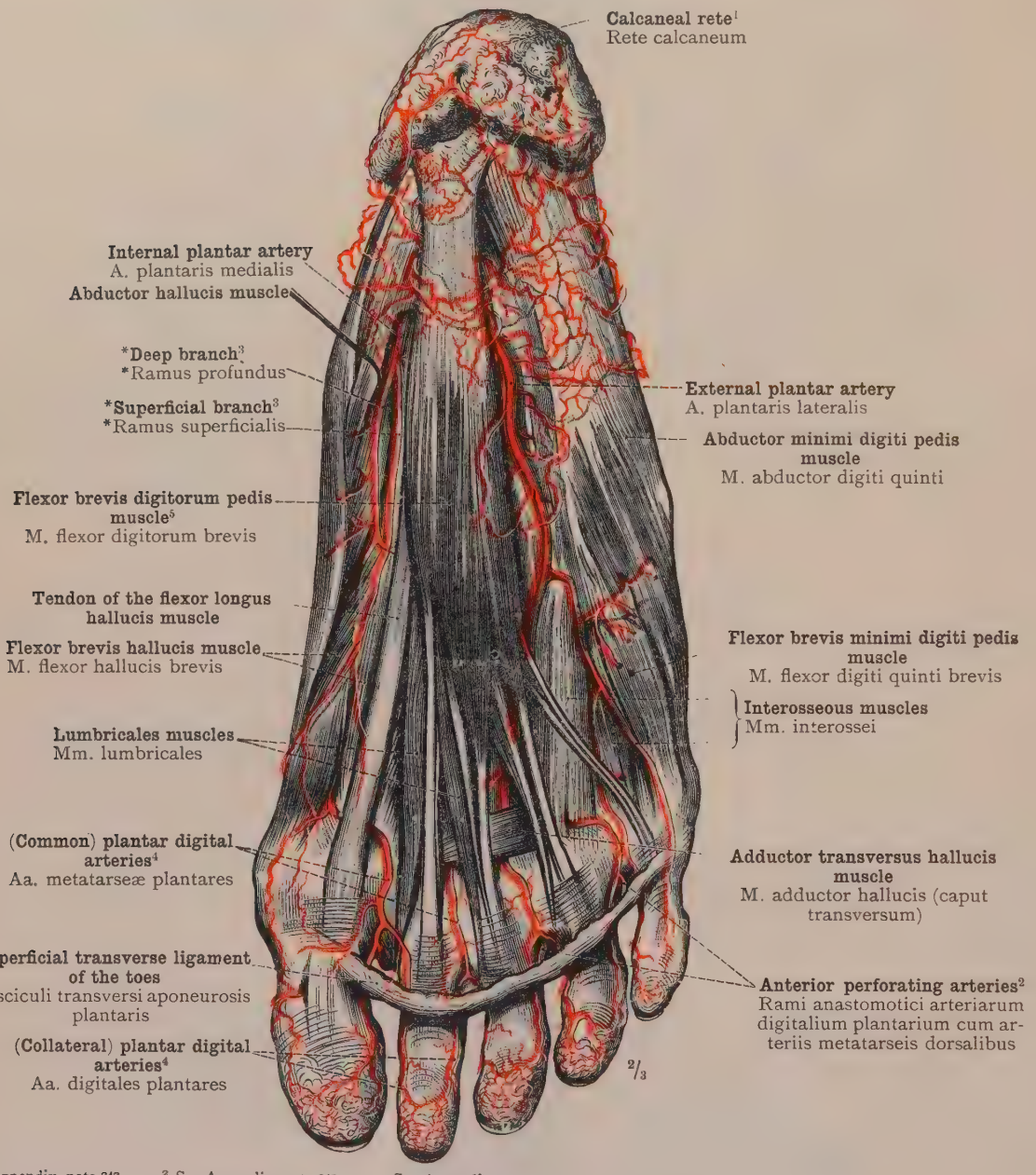
FIG. 1046.—THE POPLITEAL ARTERY, ARTERIA POPLITEA; ITS PASSAGE THROUGH THE *POPLITEAL CANAL, CANALIS POPLITEUS (*see Appendix, note* 245); THE POSTERIOR TIBIAL ARTERY AND THE PERONEAL ARTERY. RIGHT LEG AND FOOT, SEEN FROM BEHIND.

Arteries of the Back of the Leg.



1 See Appendix, note 245. 2 See Appendix, note 232. 3 See Appendix, note 248. 4 See Appendix, note 236. 5 See Appendix, note 242.
6 See Appendix, note 226. 7 See Appendix, note 249. 8 See Appendix, note 247. 9 Or *flexor perforans* muscle.

FIG. 1047.—THE ARTICULAR BRANCHES OF THE POPLITEAL ARTERY; THE ORIGIN OF THE ANTERIOR TIBIAL ARTERY (*see Appendix, note* 249); THE MEDULLARY OR NUTRITIOUS ARTERIES OF THE TIBIA AND THE FIBULA, ARTERIÆ NUTRICIÆ TIBIÆ ET FIBULÆ; THE TERMINAL DIVISION OF THE PERONEAL ARTERY. RIGHT LEG AND FOOT, SEEN FROM BEHIND.



[1] See Appendix, note [242]. [2] See Appendix, note [241]. [3] See Appendix, note [250]. [4] See Appendix, note [251]. [5] Or *flexor perforatus* muscle.

FIG. 1048.—SUPERFICIAL ARTERIES OF THE SOLE OF THE FOOT: THE CALCANEAL RETE, RETE CALCANEUM (*see Appendix, note* [242]), AND PART OF THE PLANTAR RETE (*see Appendix, note* [243]); THE EXTERNAL PLANTAR ARTERY, ARTERIA PLANTARIS LATERALIS, AND ITS SUPERFICIAL DISTRIBUTION; THE INTERNAL PLANTAR ARTERY, ARTERIA PLANTARIS MEDIALIS, AND ITS DIVISION INTO *SUPERFICIAL AND *DEEP BRANCHES, *RAMUS SUPERFICIALIS ET *RAMUS PROFUNDUS (*see Appendix, note* [250]); THE (COMMON) PLANTAR DIGITAL ARTERIES, ARTERIÆ METATARSEÆ PLANTARES (*see Appendix, note* [251]); THE (COLLATERAL) PLANTAR DIGITAL ARTERIES, ARTERIÆ DIGITALES PLANTARES (*see Appendix, note* [251]), AND THE ANTERIOR PERFORATING ARTERIES (*see Appendix, note* [241]). PLANTAR ASPECT OF THE RIGHT FOOT.

The deep fascia of the sole or plantar fascia (aponeurosis plantaris) was removed, except for the superficial transverse ligament of the toes (fasciculi transversi aponeurosis plantaris); in the heel, the subcutaneous pad of fat was left intact.

Arteries of the Sole of the Foot.

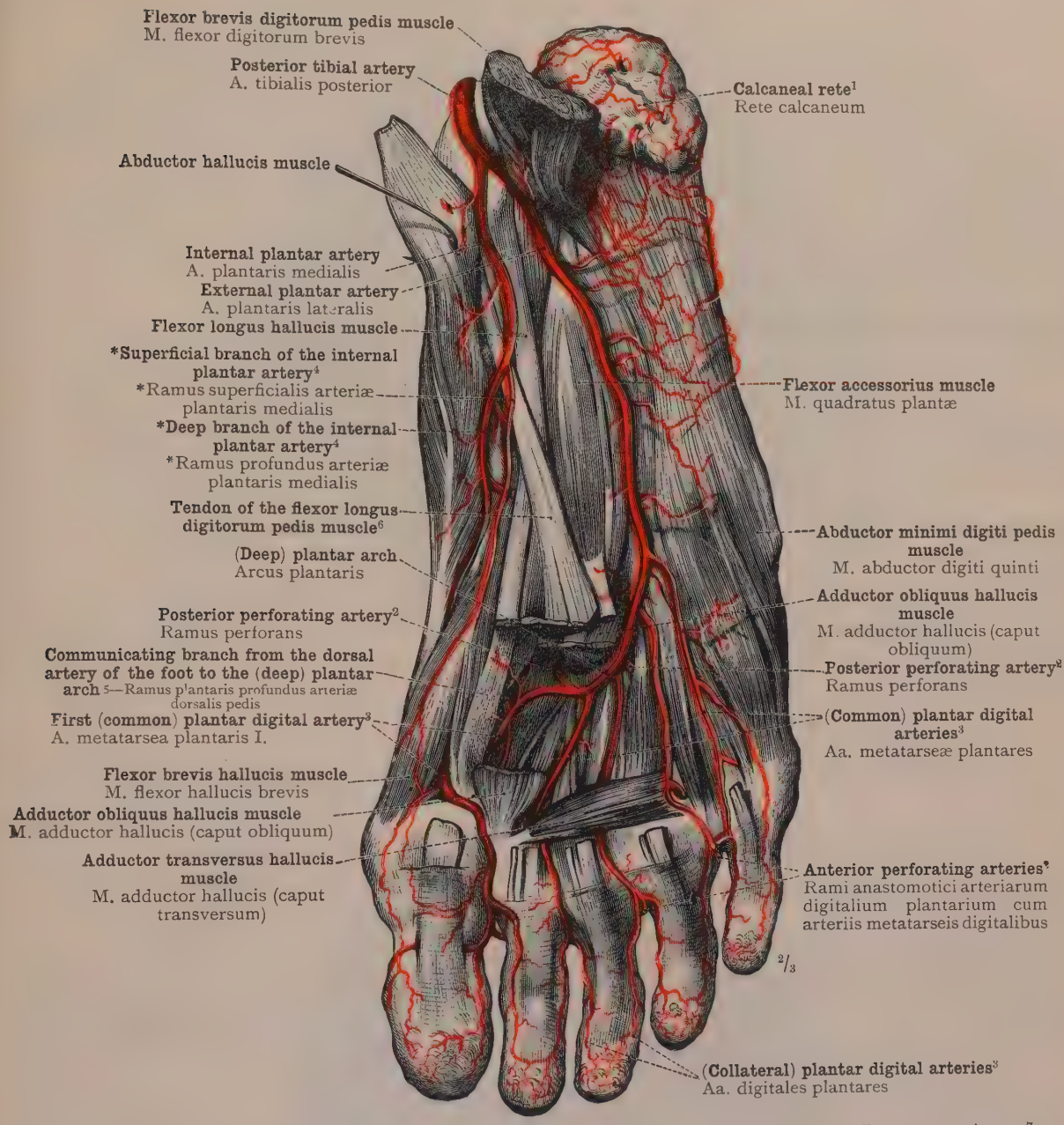

Flexor brevis digitorum pedis muscle
M. flexor digitorum brevis
Posterior tibial artery
A. tibialis posterior
Abductor hallucis muscle
Internal plantar artery
A. plantaris medialis
External plantar artery
A. plantaris lateralis
Flexor longus hallucis muscle
*Superficial branch of the internal plantar artery[4]
*Ramus superficialis arteriæ plantaris medialis
*Deep branch of the internal plantar artery[4]
*Ramus profundus arteriæ plantaris medialis
Tendon of the flexor longus digitorum pedis muscle[6]
(Deep) plantar arch
Arcus plantaris
Posterior perforating artery[2]
Ramus perforans
Communicating branch from the dorsal artery of the foot to the (deep) plantar arch[5]—Ramus plantaris profundus arteriæ dorsalis pedis
First (common) plantar digital artery[3]
A. metatarsea plantaris I.
Flexor brevis hallucis muscle
M. flexor hallucis brevis
Adductor obliquus hallucis muscle
M. adductor hallucis (caput obliquum)
Adductor transversus hallucis muscle
M. adductor hallucis (caput transversum)
Calcaneal rete[1]
Rete calcaneum
Flexor accessorius muscle
M. quadratus plantæ
Abductor minimi digiti pedis muscle
M. abductor digiti quinti
Adductor obliquus hallucis muscle
M. adductor hallucis (caput obliquum)
Posterior perforating artery[2]
Ramus perforans
(Common) plantar digital arteries[3]
Aa. metatarseæ plantares
Anterior perforating arteries[3]
Rami anastomotici arteriarum digitalium plantarium cum arteriis metatarseis digitalibus
2/3
(Collateral) plantar digital arteries[3]
Aa. digitales plantares

FIG. 1049.—DEEP ARTERIES OF THE SOLE OF THE FOOT: THE (DEEP) PLANTAR ARCH[7]; THE COMMON[3] AND THE COLLATERAL[3] PLANTAR DIGITAL ARTERIES.

In the preparation shown in Fig. 1048, in order to expose fully the two terminal branches of the posterior tibial artery, the abductor hallucis muscle was detached from the os calcis and turned outwards, the short flexor of the toes was cut across near its hinder extremity, its proximal segment being turned backwards, and its distal segment cut away as far forward as the heads of the metatarsal bones. After the partial removal of the tendons of the long flexor of the toes and of the long flexor of the great toe as well as of the adductor obliquus hallucis, the (deep) plantar arch was exposed, together with the posterior perforating and the (common) plantar digital arteries.

1 See Appendix, note 242. 2 See Appendix, note 245. 3 See Appendix, note 251. 4 See Appendix, note 250.
5 Or *first posterior perforating artery*—see Appendix, note 240. 6 Or *flexor perforans* muscle.
7 (*Deep*) *Plantar Arch.*—This is most commonly spoken of as the *plantar arch*, without qualification. Toldt also calls it simply *arcus* (*arteriosus*) *plantaris*. Some authorities, however, describe also a *superficial plantar arch*. (See Appendix, note 250.)—TR.

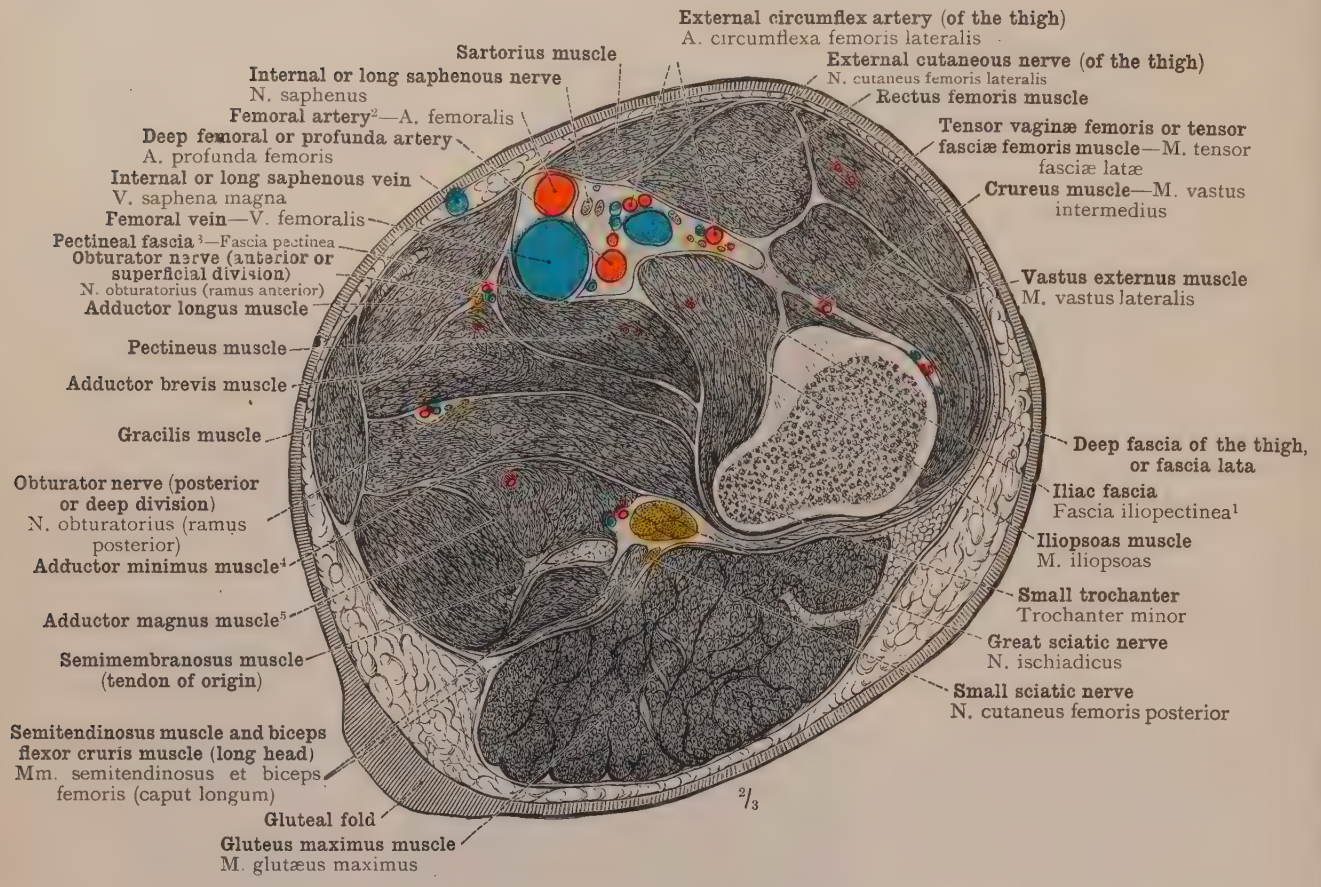


FIG. 1050.—TRANSVERSE SECTION THROUGH THE RIGHT THIGH AT THE LEVEL OF THE SMALL TROCHANTER; UPPER SURFACE OF LOWER SEGMENT.

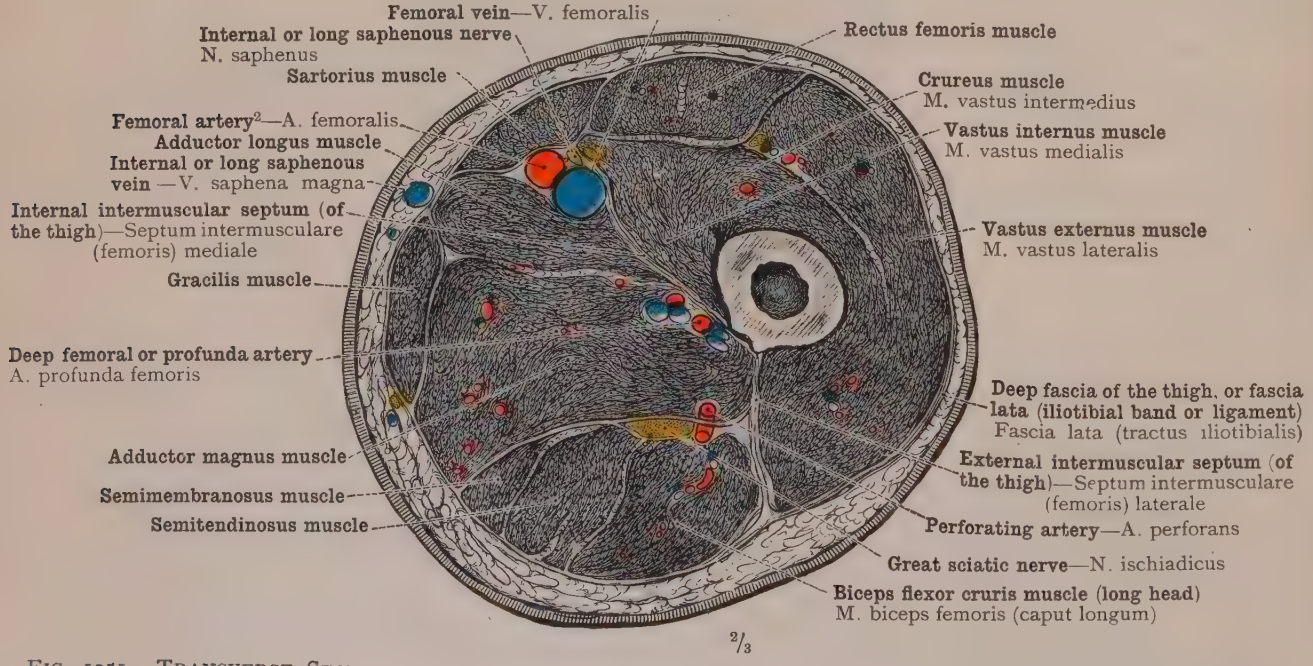

Femoral vein—V. femoralis
Internal or long saphenous nerve
N. saphenus
Rectus femoris muscle
Sartorius muscle
Crureus muscle
M. vastus intermedius
Femoral artery[2]—A. femoralis
Vastus internus muscle
M. vastus medialis
Adductor longus muscle
Internal or long saphenous vein—V. saphena magna
Internal intermuscular septum (of the thigh)—Septum intermusculare (femoris) mediale
Vastus externus muscle
M. vastus lateralis
Gracilis muscle
Deep femoral or profunda artery
A. profunda femoris
Deep fascia of the thigh, or fascia lata (iliotibial band or ligament)
Fascia lata (tractus iliotibialis)
Adductor magnus muscle
External intermuscular septum (of the thigh)—Septum intermusculare (femoris) laterale
Semimembranosus muscle
Perforating artery—A. perforans
Semitendinosus muscle
Great sciatic nerve—N. ischiadicus
Biceps flexor cruris muscle (long head)
M. biceps femoris (caput longum)
2/3

FIG. 1051.—TRANSVERSE SECTION THROUGH THE RIGHT THIGH, A LITTLE ABOVE THE MIDDLE; UPPER SURFACE OF LOWER SEGMENT.

[1] See Appendix, note [252].
[2] See Appendix, note [223].
[3] See Appendix, note [253].
[4] See note [2] to p. 644.
[5] See Appendix, note [231].

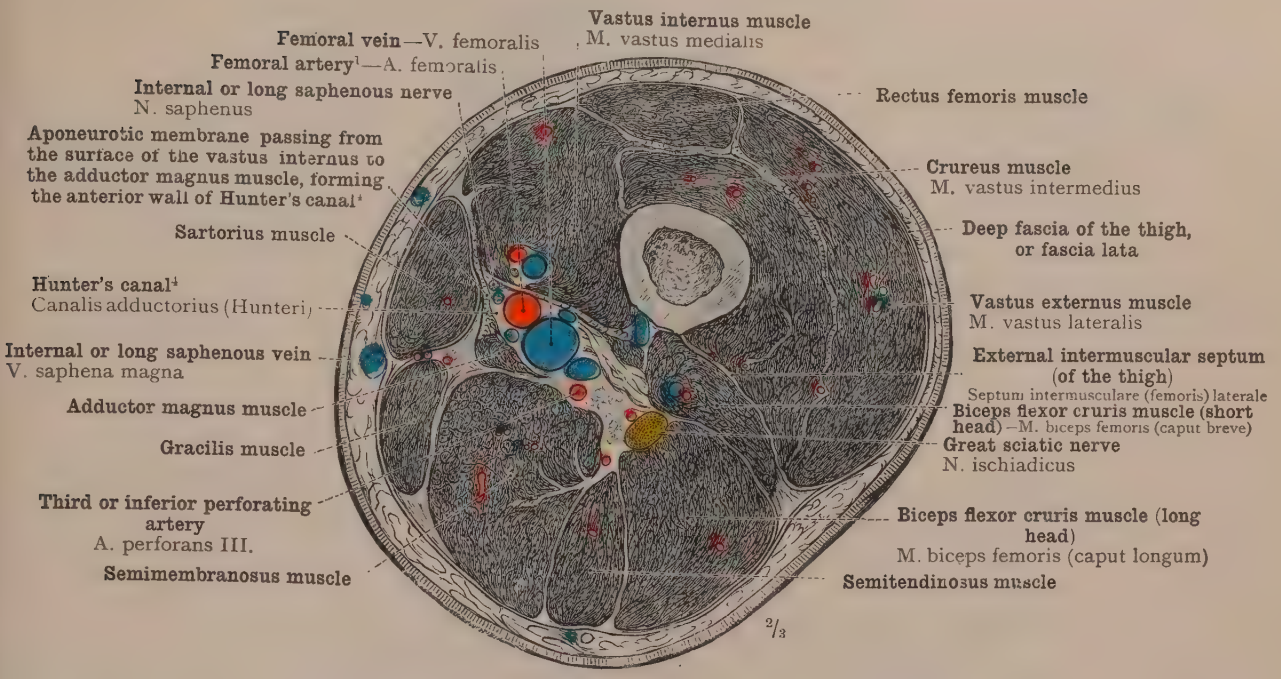

Vastus internus muscle
M. vastus medialis
Femoral vein—V. femoralis
Femoral artery[1]—A. femoralis
Internal or long saphenous nerve
N. saphenus
Rectus femoris muscle
Aponeurotic membrane passing from the surface of the vastus internus to the adductor magnus muscle, forming the anterior wall of Hunter's canal[4]
Crureus muscle
M. vastus intermedius
Sartorius muscle
Deep fascia of the thigh, or fascia lata
Hunter's canal[4]
Canalis adductorius (Hunteri)
Vastus externus muscle
M. vastus lateralis
Internal or long saphenous vein
V. saphena magna
External intermuscular septum (of the thigh)
Septum intermusculare (femoris) laterale
Adductor magnus muscle
Biceps flexor cruris muscle (short head)—M. biceps femoris (caput breve)
Gracilis muscle
Great sciatic nerve
N. ischiadicus
Third or inferior perforating artery
A. perforans III.
Biceps flexor cruris muscle (long head)
M. biceps femoris (caput longum)
Semimembranosus muscle
Semitendinosus muscle
2/3

FIG. 1052.—TRANSVERSE SECTION THROUGH THE RIGHT THIGH, A LITTLE ABOVE THE OPENING IN THE ADDUCTOR MAGNUS MUSCLE THROUGH WHICH THE FEMORAL VESSELS PASS INTO THE POPLITEAL SPACE (HIATUS ADDUCTORIUS HUNTERI); UPPER SURFACE OF LOWER SEGMENT.

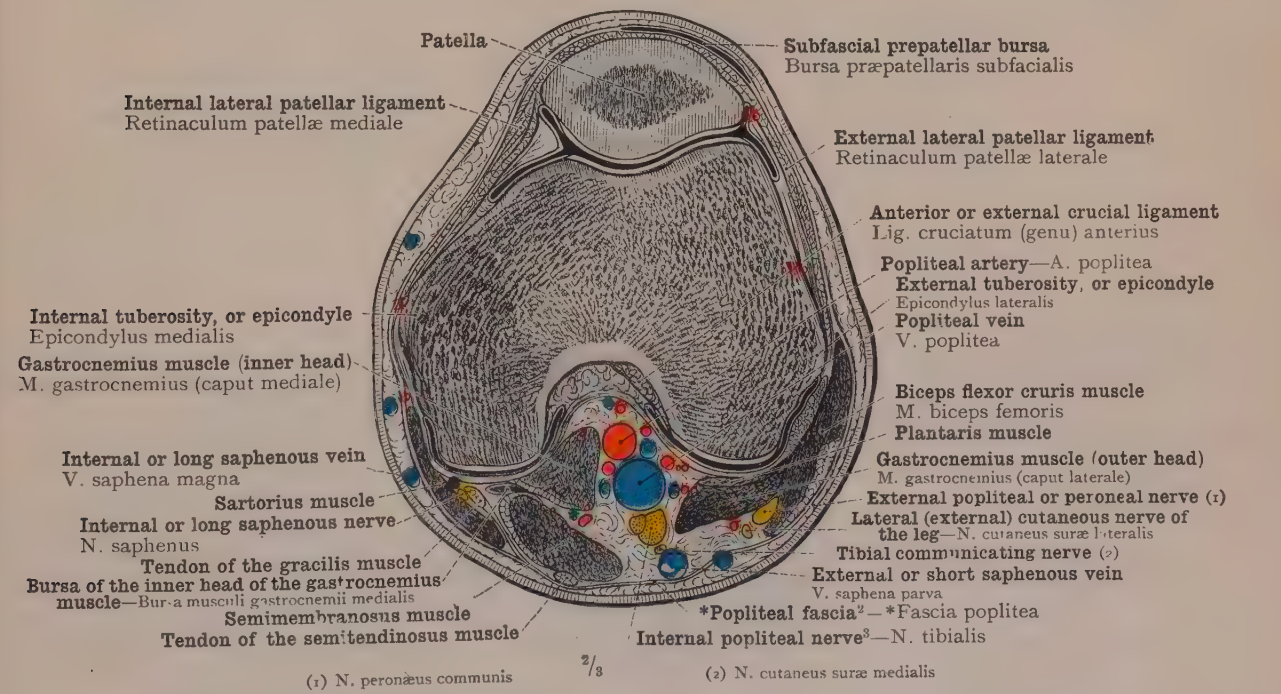


FIG. 1053.—TRANSVERSE SECTION THROUGH THE RIGHT KNEE, PASSING THROUGH THE MIDDLE OF THE PATELLA; UPPER SURFACE OF LOWER SEGMENT.

1 See Appendix, note 223.
2 **Popliteal Fascia.*—The name of *fascia poplitea* is given by the author to that portion of the deep fascia of the lower extremity which forms the roof of the popliteal space. The name is not used by Quain or Macalister.—TR.
3 See Appendix, note 254.
4 See Appendix, note 228.

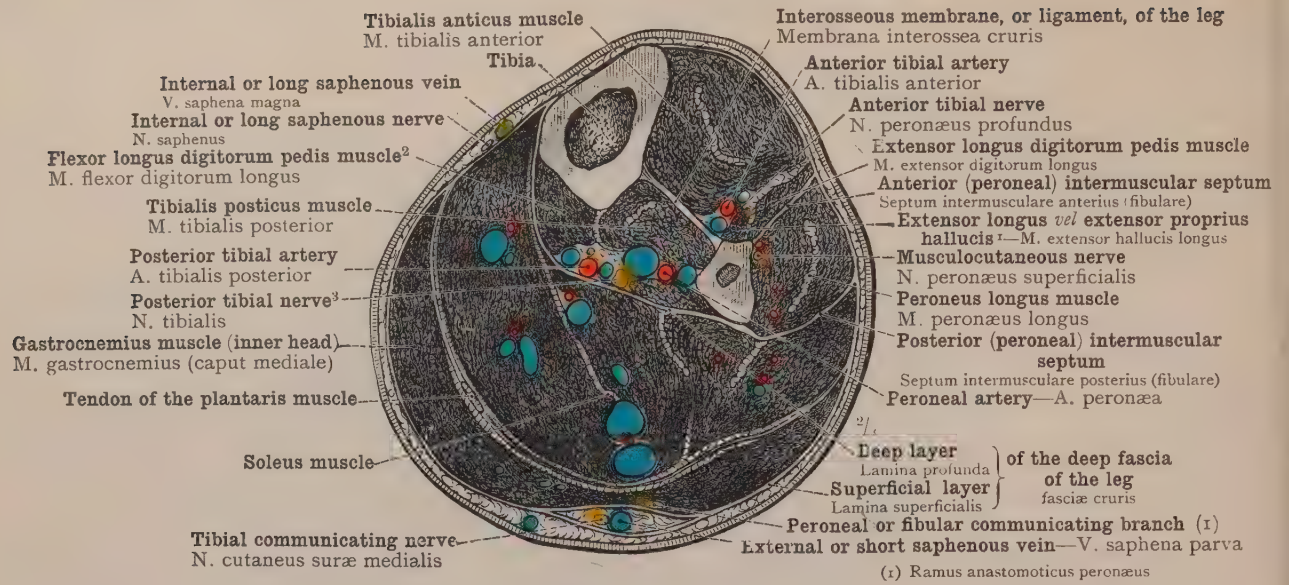


FIG. 1054.—TRANSVERSE SECTION THROUGH THE RIGHT LEG, A LITTLE ABOVE THE MIDDLE; UPPER SURFACE OF LOWER SEGMENT.

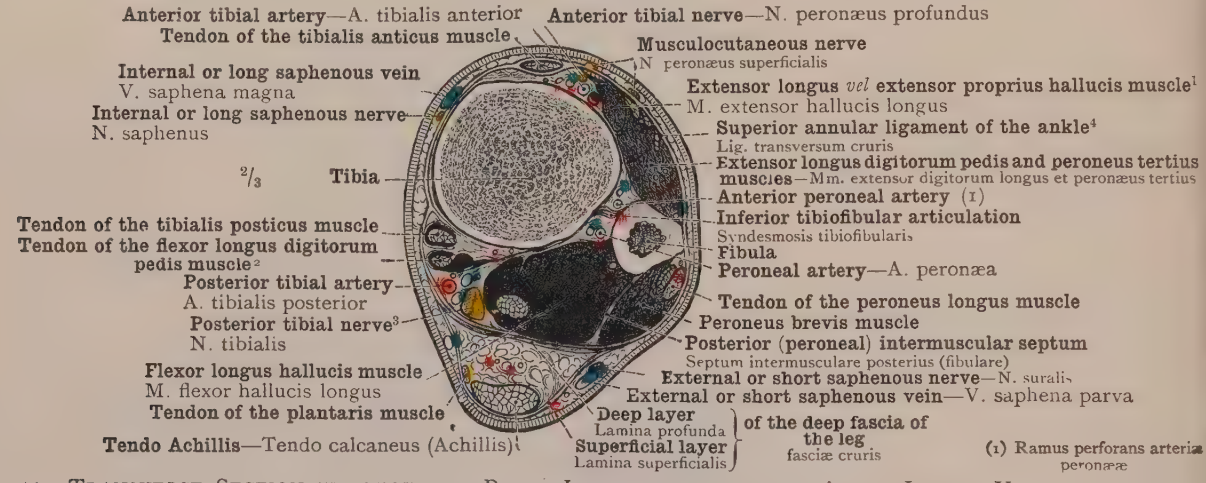

Anterior tibial artery—A. tibialis anterior
Tendon of the tibialis anticus muscle
Anterior tibial nerve—N. peronæus profundus
Musculocutaneous nerve
N. peronæus superficialis
Internal or long saphenous vein
V. saphena magna
Internal or long saphenous nerve
N. saphenus
Extensor longus vel extensor proprius hallucis muscle[1]
M. extensor hallucis longus
Superior annular ligament of the ankle[4]
Lig. transversum cruris
2/3
Tibia
Extensor longus digitorum pedis and peroneus tertius muscles—Mm. extensor digitorum longus et peronæus tertius
Anterior peroneal artery (1)
Inferior tibiofibular articulation
Syndesmosis tibiofibularis
Tendon of the tibialis posticus muscle
Tendon of the flexor longus digitorum pedis muscle[2]
Fibula
Peroneal artery—A. peronæa
Posterior tibial artery
A. tibialis posterior
Tendon of the peroneus longus muscle
Posterior tibial nerve[3]
N. tibialis
Peroneus brevis muscle
Posterior (peroneal) intermuscular septum
Septum intermusculare posterius (fibulare)
Flexor longus hallucis muscle
M. flexor hallucis longus
External or short saphenous nerve—N. suralis
External or short saphenous vein—V. saphena parva
Tendon of the plantaris muscle
Deep layer
Lamina profunda
Superficial layer
Lamina superficialis
of the deep fascia of the leg
fasciæ cruris
Tendo Achillis—Tendo calcaneus (Achillis)
(1) Ramus perforans arteriæ peronææ

FIG. 1055.—TRANSVERSE SECTION THROUGH THE RIGHT LEG, JUST ABOVE THE ANKLE-JOINT; UPPER SURFACE OF LOWER SEGMENT.

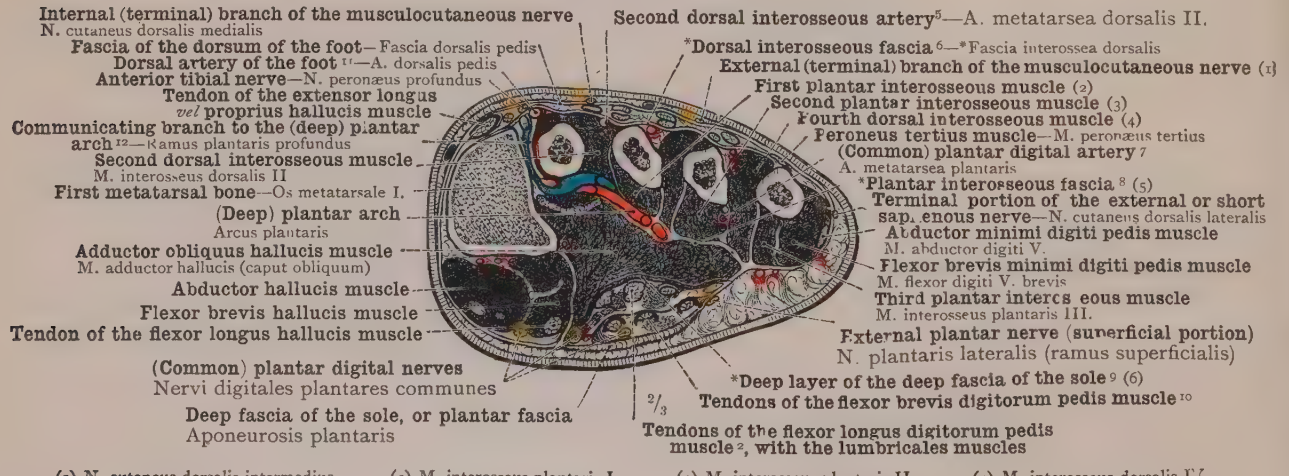
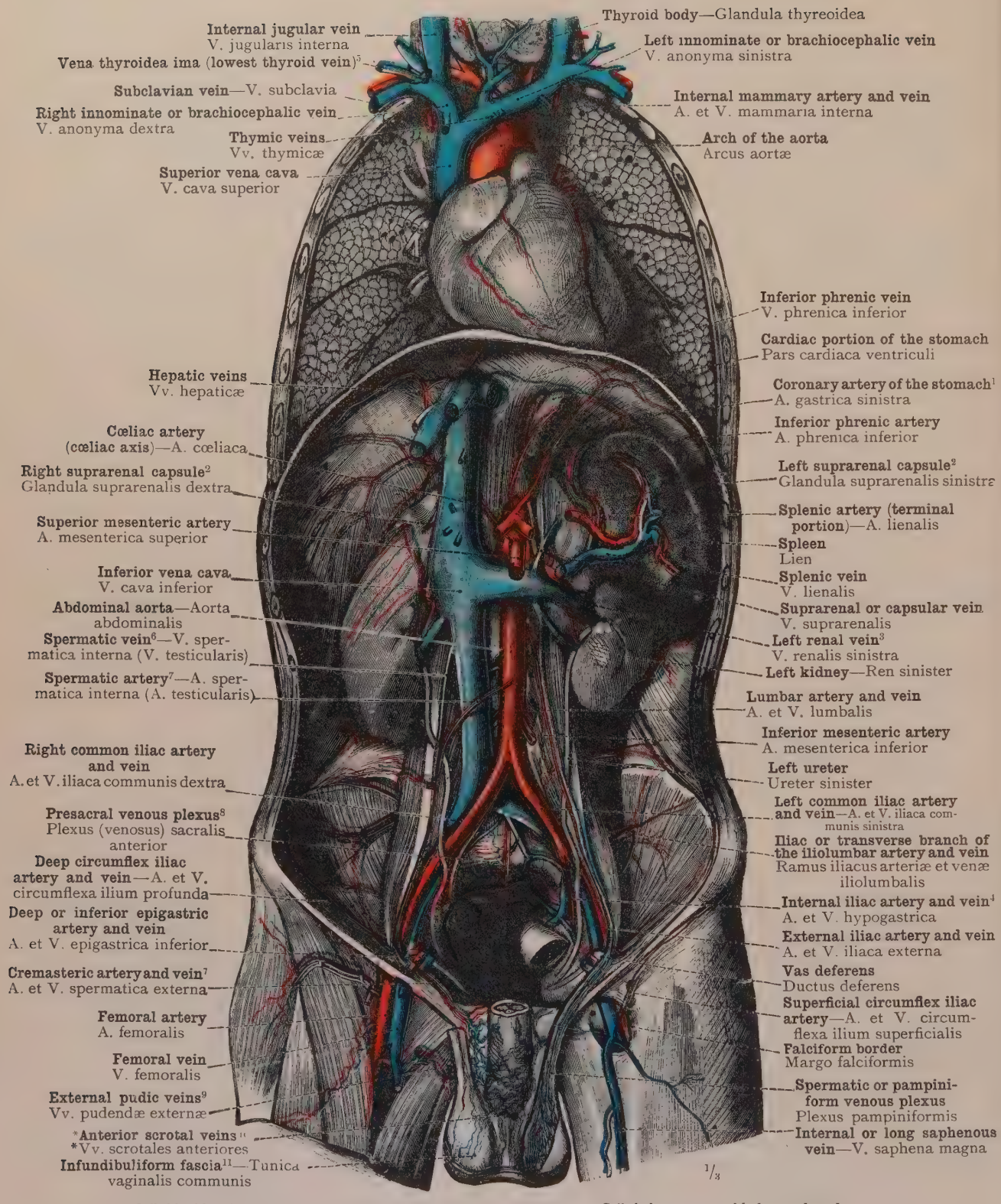

Internal (terminal) branch of the musculocutaneous nerve
N. cutaneus dorsalis medialis
Second dorsal interosseous artery[5]—A. metatarsea dorsalis II.
Fascia of the dorsum of the foot—Fascia dorsalis pedis
*Dorsal interosseous fascia[6]—*Fascia interossea dorsalis
Dorsal artery of the foot[11]—A. dorsalis pedis
External (terminal) branch of the musculocutaneous nerve (1)
Anterior tibial nerve—N. peronæus profundus
First plantar interosseous muscle (2)
Tendon of the extensor longus vel proprius hallucis muscle
Second plantar interosseous muscle (3)
Fourth dorsal interosseous muscle (4)
Communicating branch to the (deep) plantar arch[12]—Ramus plantaris profundus
Peroneus tertius muscle—M. peronæus tertius
(Common) plantar digital artery[7]
A. metatarsea plantaris
Second dorsal interosseous muscle
M. interosseus dorsalis II
*Plantar interosseous fascia[8] (5)
First metatarsal bone—Os metatarsale I.
Terminal portion of the external or short saphenous nerve—N. cutaneus dorsalis lateralis
(Deep) plantar arch
Arcus plantaris
Abductor minimi digiti pedis muscle
M. abductor digiti V.
Adductor obliquus hallucis muscle
M. adductor hallucis (caput obliquum)
Flexor brevis minimi digiti pedis muscle
M. flexor digiti V. brevis
Abductor hallucis muscle
Third plantar interosseous muscle
M. interosseus plantaris III.
Flexor brevis hallucis muscle
External plantar nerve (superficial portion)
N. plantaris lateralis (ramus superficialis)
Tendon of the flexor longus hallucis muscle
(Common) plantar digital nerves
Nervi digitales plantares communes
*Deep layer of the deep fascia of the sole[9] (6)
2/3
Tendons of the flexor brevis digitorum pedis muscle[10]
Deep fascia of the sole, or plantar fascia
Aponeurosis plantaris
Tendons of the flexor longus digitorum pedis muscle[2], with the lumbricales muscles
(1) N. cutaneus dorsalis intermedius
(2) M. interosseus plantaris I.
(3) M. interosseus plantaris II.
(4) M. interosseus dorsalis IV.
(5) *Fascia interossea plantaris
(6) *Fascia plantaris profunda

FIG. 1056.—CORONAL SECTION THROUGH THE RIGHT FOOT, PASSING THROUGH THE MIDDLE OF THE FIRST METATARSAL BONE; SURFACE OF DISTAL SEGMENT.

[1] Regarding the nomenclature of this muscle, see note [2] to p. 364, in Part III.
[2] Or *flexor perforans* muscle.
[3] See Appendix, note [254].
[4] Known also as the *upper band* of the *anterior annular ligament of the ankle.*
[5] See Appendix, note [237].
[6] See Appendix, note [255].
[7] See Appendix, note [251].
[8] See Appendix, note [256].
[9] See Appendix, note [257].
[10] Or *flexor perforatus* muscle.
[11] Often known in England by its Latin name of *dorsalis pedis artery.*
[12] See Appendix, note [249].

VENÆ TRUNCI

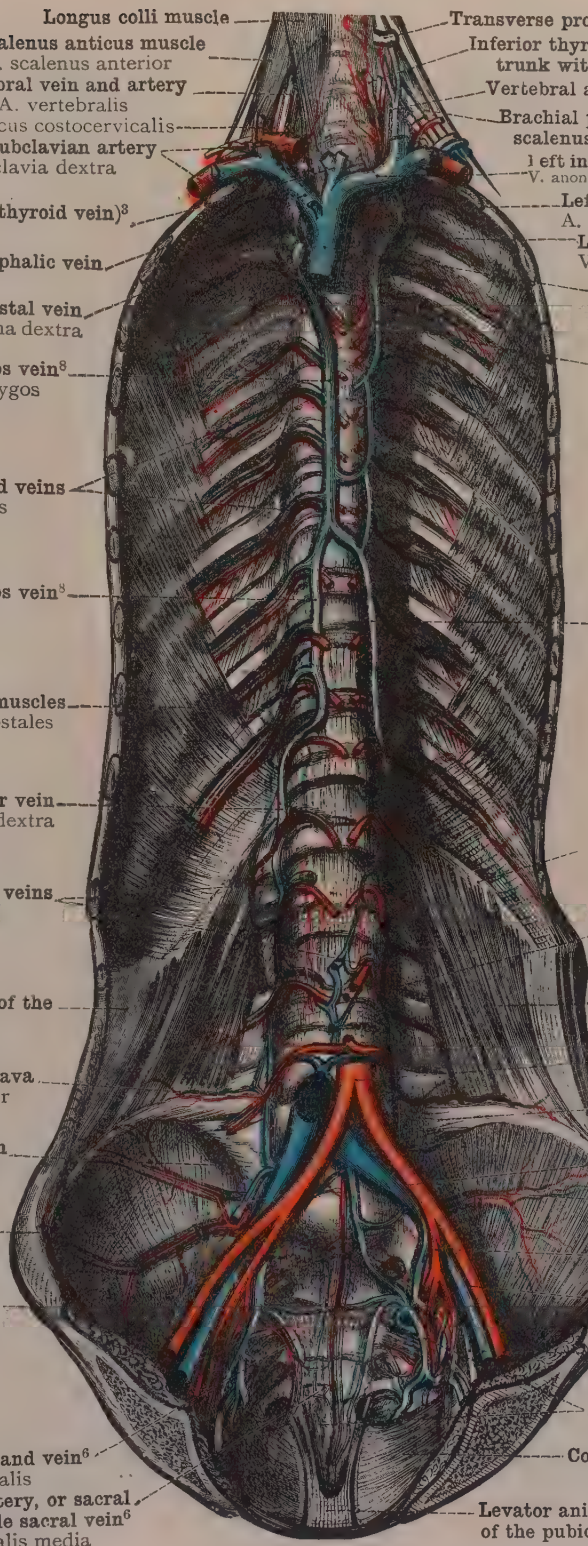
THE VEINS OF THE TRUNK



[1] Called by Macalister the *gastric artery*.
[2] Called also *suprarenal body*, or *adrenal*.
[3] Sometimes called the *emulgent veins*. See note [3] to p. 595.
[4] See Appendix, note [120].
[5] Companion to the *thyroidea ima artery*. See note [1] to p. 590.
[6] This vein is called by the author *vena spermatica interna* to distinguish it from the *vena spermatica externa*—the *cremasteric vein* of English anatomists.—Tr.
[7] See Appendix, note [129].
[8] See Appendix. note [258].
[9] Called by Macalister the *pubic veins*. See note on nomenclature of corresponding arteries (note 5 to p. 599).
[10] See Appendix, note [138].
[11] See Appendix to Part IV., note [68].

FIG. 1057.—THE SUPERIOR AND THE INFERIOR VENA CAVA; THE PARIETAL AND THE VISCERAL TRIBUTARIES, RADICES PARIETALES ET VISCERALES, OF THE LATTER. THE ABDOMINAL AORTA, AORTA ABDOMINALIS. SEEN FROM BEFORE.

The System of the Superior and the Inferior Venæ Cavæ.



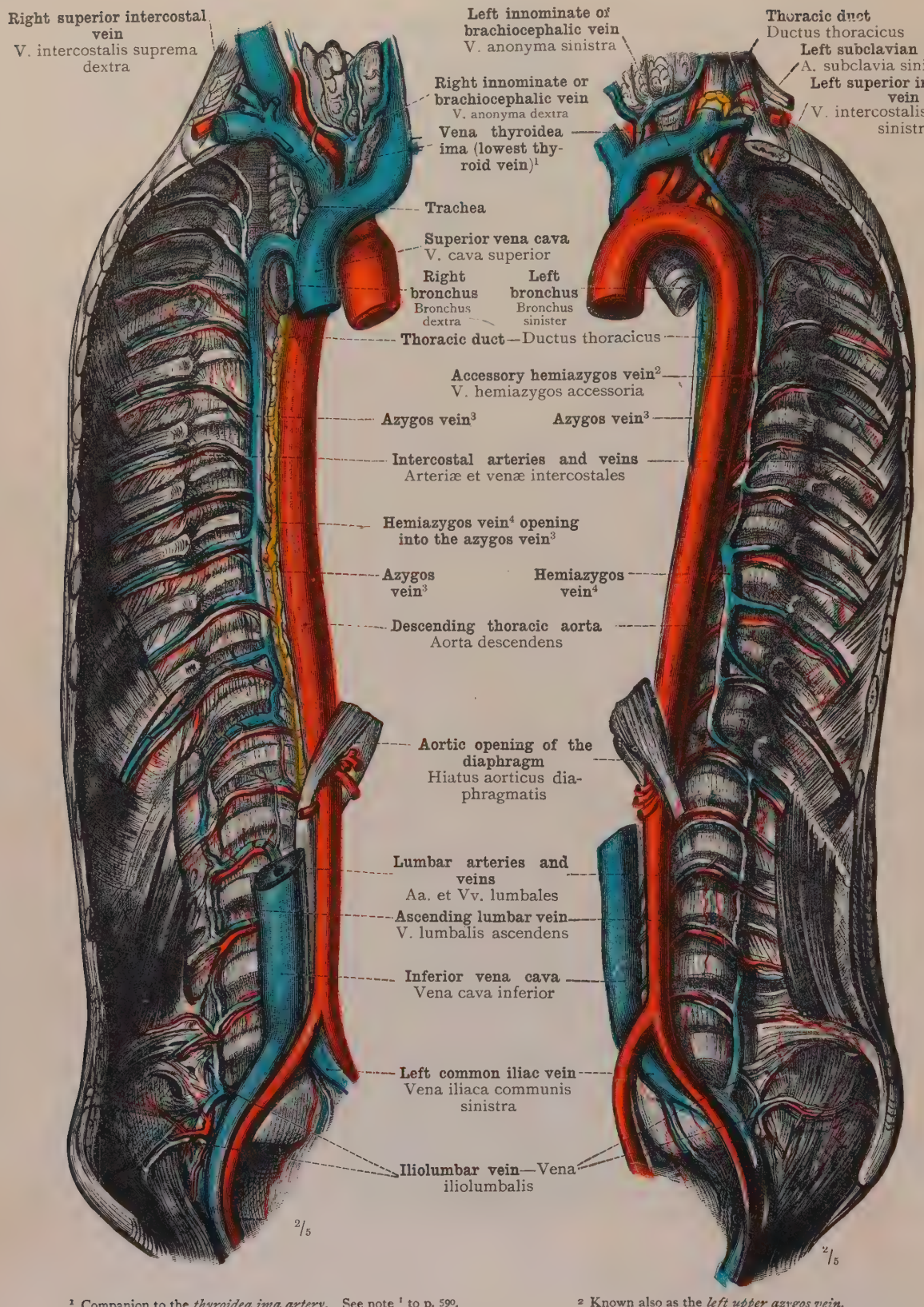
Longus colli muscle
Scalenus anticus muscle
M. scalenus anterior
Vertebral vein and artery
V. et A. vertebralis
Costocervical axis[11]—Truncus costocervicalis
Right subclavian artery
A. subclavia dextra
Vena thyroidea ima (lowest thyroid vein)[3]
V. thyreoidea ima
Left innominate or brachiocephalic vein
V. anonyma dextra
Right superior intercostal vein
V. intercostalis suprema dextra
Azygos vein[8]
V. azygos
Intercostal arteries and veins
Aa. et Vv. intercostales
Azygos vein[8]
Subcostal muscles
Mm. subcostales
Right ascending lumbar vein
V. lumbalis ascendens dextra
Lumbar arteries and veins
Aa. et Vv. lumbales
Superficial or posterior layer of the lumbar fascia[9]
Fascia lumbodorsalis
Inferior vena cava
V. cava inferior
Iliolumbar vein
V. iliolumbalis
Iliacus muscle
Deep circumflex iliac artery and vein
A. et V. circumflexa ilium profunda
Lateral sacral artery and vein[6]
A. et V. sacralis lateralis
Middle sacral artery, or sacral aorta,[10] and middle sacral vein[6]
A. et V. sacralis media

Transverse process of the sixth cervical vertebra
Inferior thyroid artery arising by a common trunk with the vertebral artery (var.)
Vertebral artery and vein—A. et V. vertebralis
Brachial plexus (exposed by the removal of the scalenus anticus muscle)—Plexus brachialis
Left innominate or brachiocephalic vein
V. anonyma sinistra
Left subclavian artery
A. subclavia sinistra
Left superior intercostal vein
V. intercostalis suprema sinistra
Superior vena cava
V. cava superior
Accessory hemiazygos vein[1]
V. hemiazygos accessoria
Hemiazygos vein[2]
2/5
Twelfth rib
Costa XII.
Left ascending lumbar vein
V. lumbalis ascendens sinistra
Quadratus lumborum muscle
Abdominal aorta
Aorta abdominalis
Iliolumbar ligament
Lig. iliolumbale
Left common iliac artery and vein
A. et V. iliaca communis sinistra
Iliac or transverse branch of the iliolumbar artery and vein
Ramus iliacus arteriæ et venæ iliolumbalis
Left internal iliac artery[4]
A. hypogastrica sinistra
Left external iliac artery and vein
A. et V. iliaca externa sinistra
*External umbilical ligament[5]
*Lig. umbilicale laterale
Presacral venous plexus[6]
Plexus (venosus) sacralis anterior
Coccygeus or levator coccygis muscle
Levator ani muscle (tendon of insertion of the pubic portion)[7]—M. levator ani

1 Called also the *left upper azygos vein.*
2 Known also as the *left lower* or *small azygos vein.*
3 Companion to the *thyroidea ima artery.* See note 1 to p. 590.
4 See Appendix, note 120.
5 The remains of the obliterated *hypogastric artery* of the fœtus.—See note 4 to p. 387, in Part III.
6 See Appendix, note 258.
7 That portion of the levator ani muscle which is distinguished by Toldt as the *pars pubica* is by Savage called the *pubococcygeus muscle.* See note 6 to p. 529, in Part IV.
8 Called also the *right* or *large azygos vein.*
9 See note 1 to p. 267 and note 1 to p. 285, in Part III.
10 See Appendix, note 127.
11 See Appendix, note 177.

FIG. 1058.—THE VEINS ON THE INNER SURFACE OF THE POSTERIOR WALL OF THE TRUNK. SEEN FROM BEFORE.

The System of the Azygos and Hemiazygos Veins.

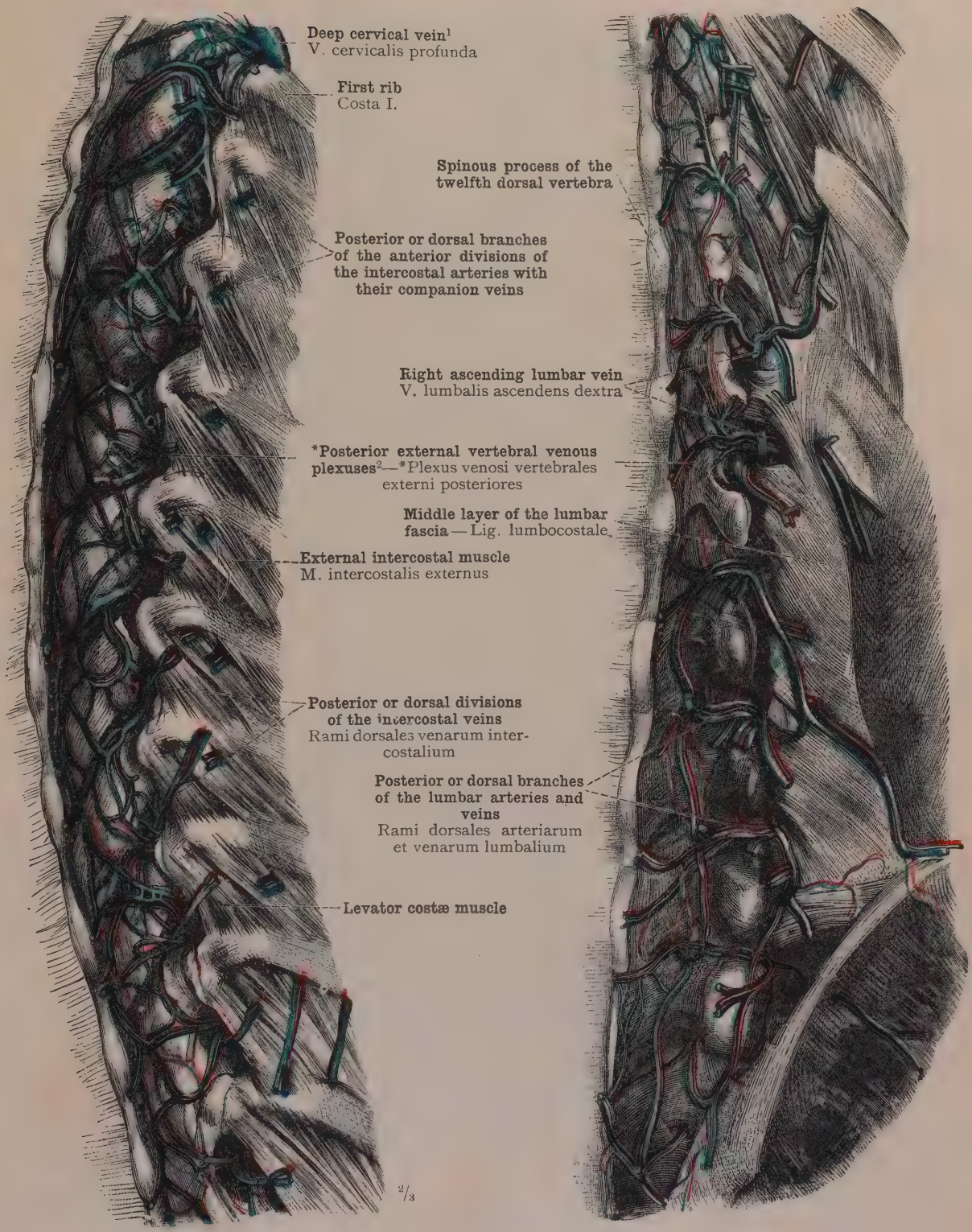


[1] Companion to the *thyroidea ima artery*. See note [1] to p. 590.
[2] Known also as the *left upper azygos vein*.
[3] Known also as the *right* or *large azygos vein*.
[4] Known also as the *left lower* or *small azygos vein*.

FIG. 1059.—SEEN FROM THE RIGHT SIDE.

FIG. 1060.—SEEN FROM THE LEFT SIDE.

The System of the Azygos and Hemiazygos Veins.


Deep cervical vein[1]
V. cervicalis profunda
First rib
Costa I.
Spinous process of the twelfth dorsal vertebra
Posterior or dorsal branches of the anterior divisions of the intercostal arteries with their companion veins
Right ascending lumbar vein
V. lumbalis ascendens dextra
*Posterior external vertebral venous plexuses[2]—*Plexus venosi vertebrales externi posteriores
Middle layer of the lumbar fascia—Lig. lumbocostale
External intercostal muscle
M. intercostalis externus
Posterior or dorsal divisions of the intercostal veins
Rami dorsales venarum intercostalium
Posterior or dorsal branches of the lumbar arteries and veins
Rami dorsales arteriarum et venarum lumbalium
Levator costæ muscle
2/3

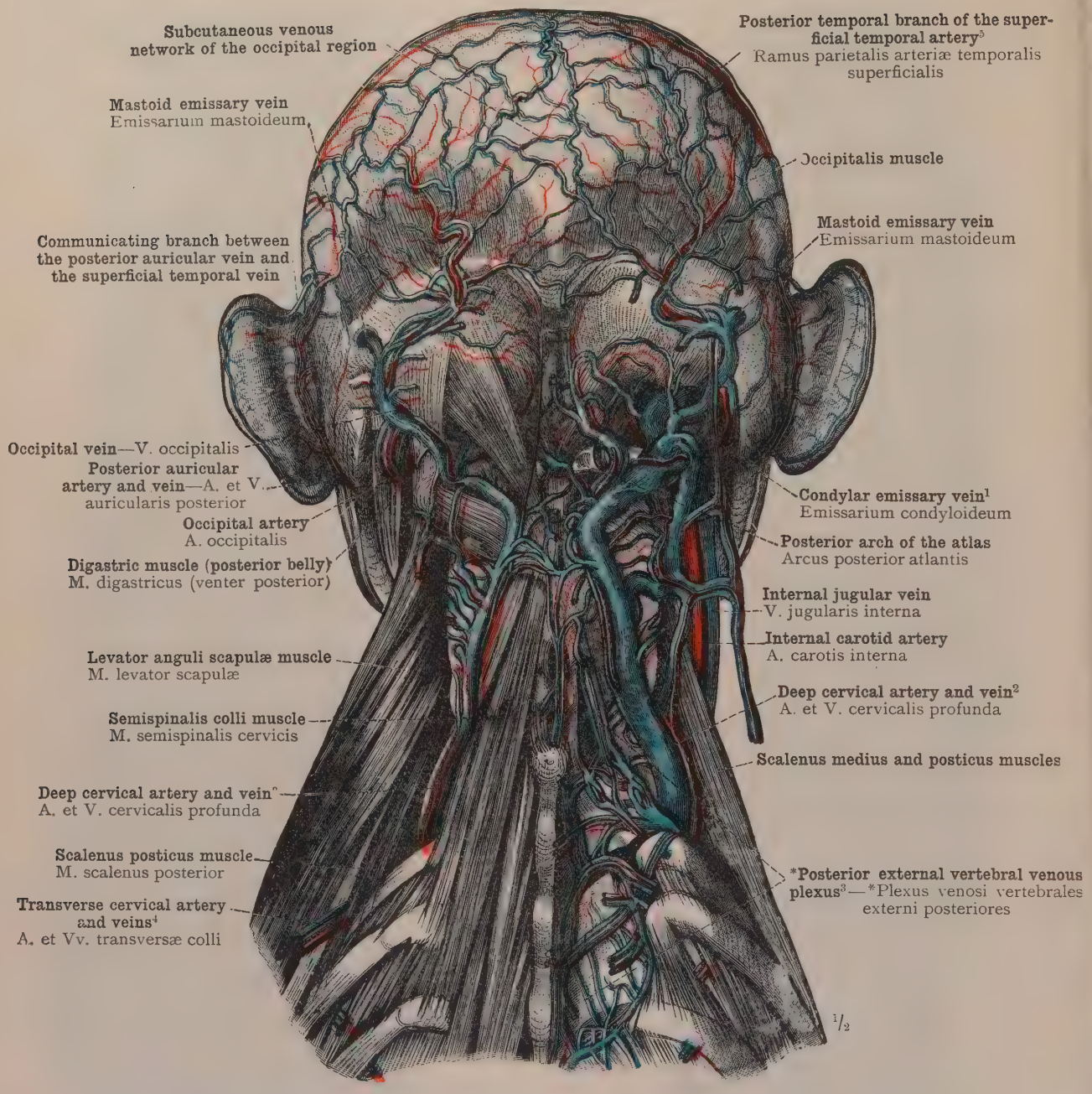
[1] Known also as the *posterior vertebral vein.*

See Appendix, notes 259 and 260.

FIG. 1061.—*POSTERIOR EXTERNAL VERTEBRAL VENOUS PLEXUS (*see Appendix, notes* 259 *and* 260) OF THE DORSAL REGION.

FIG. 1062.—*POSTERIOR EXTERNAL VERTEBRAL VENOUS PLEXUS (*see Appendix, notes* 259 *and* 260) OF THE LUMBAR AND SACRAL REGIONS.

Plexus venosi vertebrales externi posteriores—The posterior external vertebral venous plexuses.


Subcutaneous venous network of the occipital region
Mastoid emissary vein
Emissarium mastoideum
Communicating branch between the posterior auricular vein and the superficial temporal vein
Occipital vein—V. occipitalis
Posterior auricular artery and vein—A. et V. auricularis posterior
Occipital artery
A. occipitalis
Digastric muscle (posterior belly)
M. digastricus (venter posterior)
Levator anguli scapulæ muscle
M. levator scapulæ
Semispinalis colli muscle
M. semispinalis cervicis
Deep cervical artery and vein
A. et V. cervicalis profunda
Scalenus posticus muscle
M. scalenus posterior
Transverse cervical artery and veins
A. et Vv. transversæ colli
Posterior temporal branch of the superficial temporal artery
Ramus parietalis arteriæ temporalis superficialis
Occipitalis muscle
Mastoid emissary vein
Emissarium mastoideum
Condylar emissary vein
Emissarium condyloideum
Posterior arch of the atlas
Arcus posterior atlantis
Internal jugular vein
V. jugularis interna
Internal carotid artery
A. carotis interna
Deep cervical artery and vein
A. et V. cervicalis profunda
Scalenus medius and posticus muscles
*Posterior external vertebral venous plexus
*Plexus venosi vertebrales externi posteriores
1/2

1 See Appendix, note 261.
2 The *deep cervical vein* is known also as the *posterior vertebral vein.*
3 See Appendix, notes 259 and 260.
4 See Appendix, note 262.
5 See Appendix note 168.

FIG. 1063.—THE VEINS OF THE OCCIPITAL REGION AND THE DEEP VEINS OF THE BACK OF THE NECK, SEEN FROM BEHIND: THE SUBCUTANEOUS VENOUS NETWORK OF THE OCCIPITAL REGION; THE OCCIPITAL VEIN, VENA OCCIPITALIS, CONTINUOUS BELOW WITH THE DEEP CERVICAL VEIN, VENA CERVICALIS PROFUNDA; THE MASTOID EMISSARY VEIN, EMISSARIUM MASTOIDEUM, AND THE CONDYLAR EMISSARY VEIN, EMISSARIUM CONDYLOIDEUM (*see Appendix, note* 261); THE *POSTERIOR EXTERNAL VERTEBRAL VENOUS PLEXUS, *PLEXUS VENOSI VERTEBRALES POSTERIORES (*see Appendix, notes* 259 *and* 260); THE POSTERIOR AURICULAR VEIN, VENA AURICULARIS POSTERIOR.

On the left side the levator anguli scapulæ muscle was drawn outwards, and, after the removal of the complexus or semispinalis capitis muscle, the short posterior craniovertebral or suboccipital muscles and the semispinalis colli muscle were exposed. On the right side these muscles also were removed, and the *posterior external vertebral venous plexus was thus laid bare.

The Deep Veins of the Nuchal and Occipital Regions.

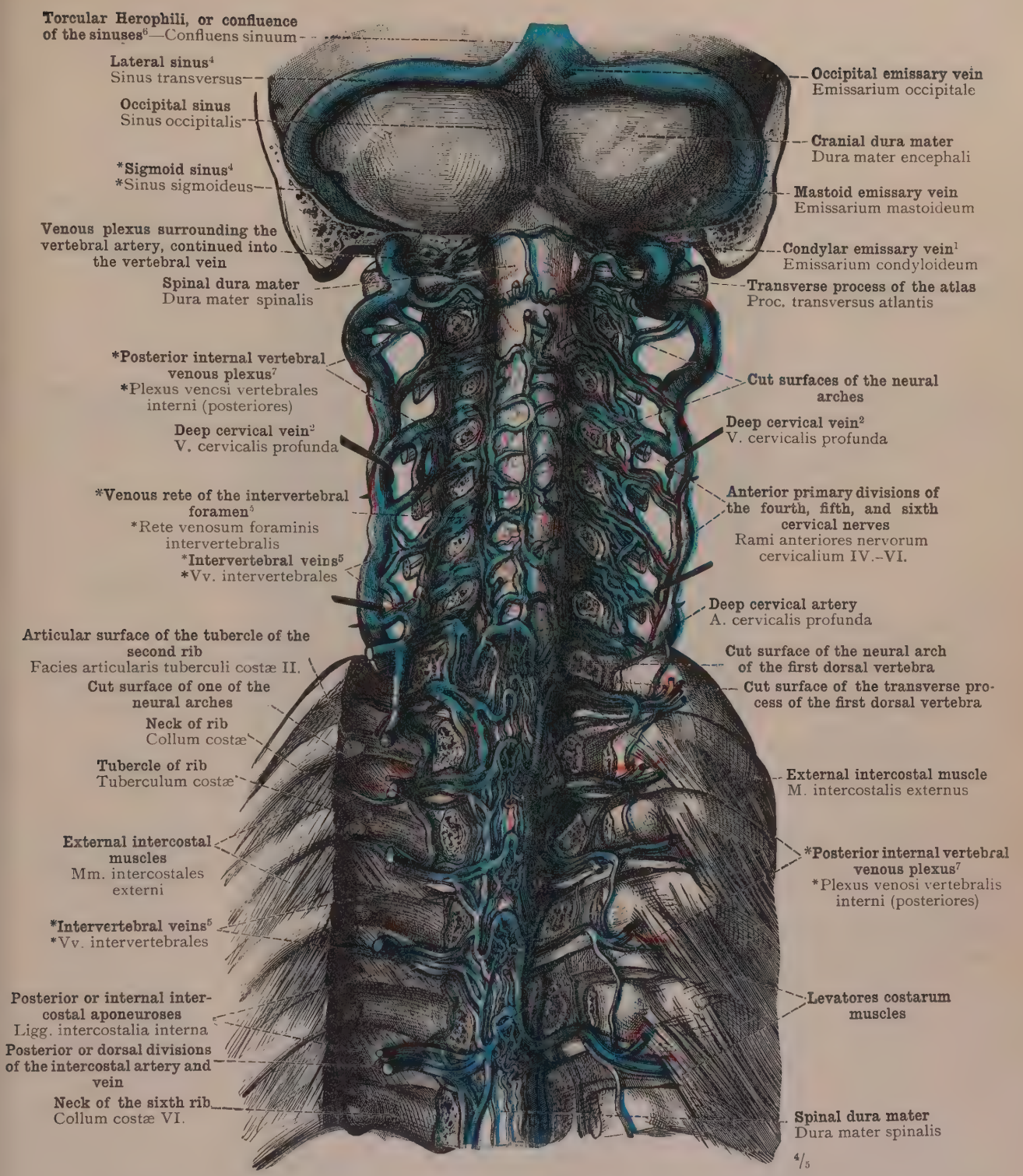
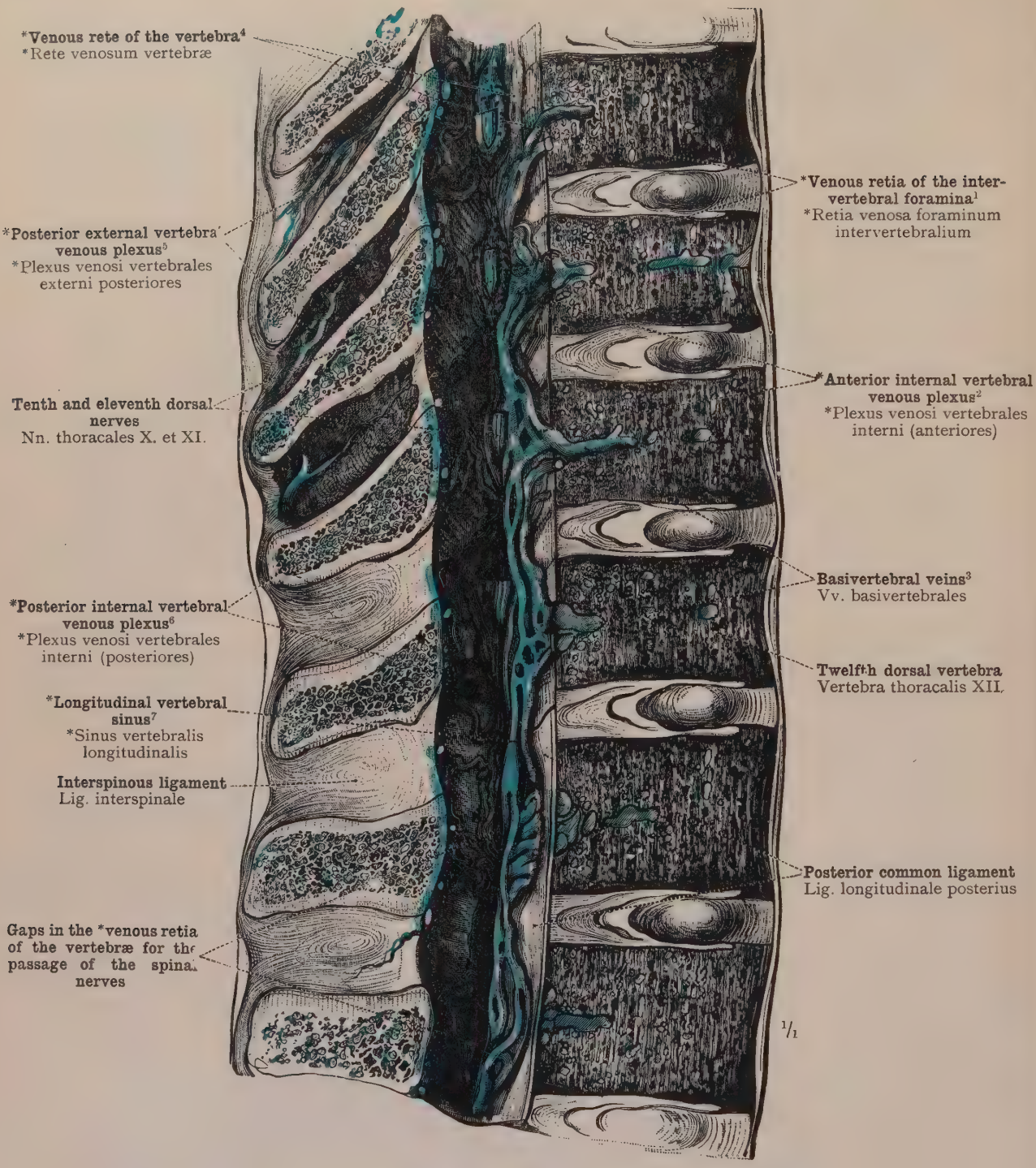

Torcular Herophili, or confluence of the sinuses[6]—Confluens sinuum
Lateral sinus[4]
Sinus transversus
Occipital sinus
Sinus occipitalis
*Sigmoid sinus[4]
*Sinus sigmoideus
Venous plexus surrounding the vertebral artery, continued into the vertebral vein
Spinal dura mater
Dura mater spinalis
*Posterior internal vertebral venous plexus[7]
*Plexus vencsi vertebrales interni (posteriores)
Deep cervical vein[2]
V. cervicalis profunda
*Venous rete of the intervertebral foramen[5]
*Rete venosum foraminis intervertebralis
*Intervertebral veins[5]
*Vv. intervertebrales
Articular surface of the tubercle of the second rib
Facies articularis tuberculi costæ II.
Cut surface of one of the neural arches
Neck of rib
Collum costæ
Tubercle of rib
Tuberculum costæ
External intercostal muscles
Mm. intercostales externi
*Intervertebral veins[5]
*Vv. intervertebrales
Posterior or internal intercostal aponeuroses
Ligg. intercostalia interna
Posterior or dorsal divisions of the intercostal artery and vein
Neck of the sixth rib
Collum costæ VI.
Occipital emissary vein
Emissarium occipitale
Cranial dura mater
Dura mater encephali
Mastoid emissary vein
Emissarium mastoideum
Condylar emissary vein[1]
Emissarium condyloideum
Transverse process of the atlas
Proc. transversus atlantis
Cut surfaces of the neural arches
Deep cervical vein[2]
V. cervicalis profunda
Anterior primary divisions of the fourth, fifth, and sixth cervical nerves
Rami anteriores nervorum cervicalium IV.–VI.
Deep cervical artery
A. cervicalis profunda
Cut surface of the neural arch of the first dorsal vertebra
Cut surface of the transverse process of the first dorsal vertebra
External intercostal muscle
M. intercostalis externus
*Posterior internal vertebral venous plexus[7]
*Plexus venosi vertebralis interni (posteriores)
Levatores costarum muscles
Spinal dura mater
Dura mater spinalis
4/5

FIG. 1064.—*INTERNAL VERTEBRAL VENOUS PLEXUS (*see Appendix, notes* [259] *and* [263]), LAID BARE FROM BEHIND BY OPENING THE SPINAL CANAL IN THE CERVICAL AND THE UPPER DORSAL PORTIONS OF THE VERTEBRAL COLUMN; THE CONNEXIONS OF THE PLEXUS WITH THE DEEP CERVICAL VEIN (*see note* [2] *above*) AND WITH THE INTERCOSTAL VEINS. THE VENOUS SINUSES OF THE CRANIUM (MENINGEAL SINUSES), SINUS DURÆ MATRIS.

1 See Appendix, note [261].
2 Known also as the *posterior vertebral vein.*
3 See Appendix, note [263].
4 See Appendix, note [264].
5 See Appendix, note [265].
6 See Appendix, note [266].
7 See Appendix, notes [259] and [263].

Plexus venosi vertebrales interni—The *internal vertebral venous plexus.—V. cervicalis profunda—The deep cervical vein.

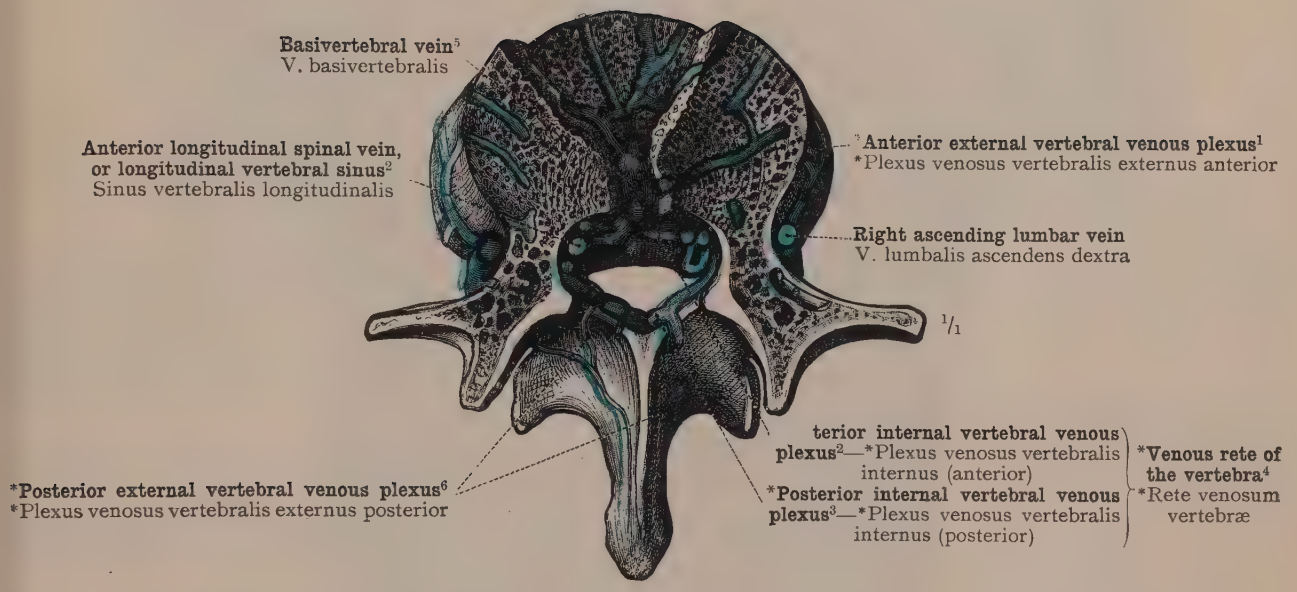

*Venous rete of the vertebra[4]
*Rete venosum vertebræ
*Posterior external vertebral venous plexus[5]
*Plexus venosi vertebrales externi posteriores
Tenth and eleventh dorsal nerves
Nn. thoracales X. et XI.
*Posterior internal vertebral venous plexus[6]
*Plexus venosi vertebrales interni (posteriores)
*Longitudinal vertebral sinus[7]
*Sinus vertebralis longitudinalis
Interspinous ligament
Lig. interspinale
Gaps in the *venous retia of the vertebræ for the passage of the spinal nerves
*Venous retia of the intervertebral foramina[1]
*Retia venosa foraminum intervertebralium
*Anterior internal vertebral venous plexus[2]
*Plexus venosi vertebrales interni (anteriores)
Basivertebral veins[3]
Vv. basivertebrales
Twelfth dorsal vertebra
Vertebra thoracalis XII.
Posterior common ligament
Lig. longitudinale posterius
1/1

[1] See Appendix, note 265.
[2] See Appendix, notes 259 and 267.
[3] See Appendix, note 268.
[4] See Appendix, note 269.
[5] See Appendix, notes 259 and 260.
[6] See Appendix, notes 259 and 263.
[7] Or *anterior longitudinal spinal vein.* See Appendix, notes 200 and 267.

FIG. 1065.—THE *INTERNAL VERTEBRAL VENOUS PLEXUSES, *PLEXUS VENOSI VERTEBRALES INTERNI (*see Appendix, notes 259 and 263*), DISPLAYED IN THE LEFT HALF OF A MEDIAN SAGITTAL SECTION THROUGH THE FOUR LOWERMOST DORSAL AND THE TWO UPPERMOST LUMBAR VERTEBRÆ; THEIR CONNEXION WITH THE BASIVERTEBRAL VEINS, VENÆ BASIVERTEBRALES (*see Appendix, note* 268), AND THEIR RELATION TO THE EMERGING ROOTS OF THE SPINAL NERVES.

The posterior common ligament was removed from the dorsal vertebræ, but left intact on the lumbar vertebræ. Between the spinous processes of the eighth, ninth, and tenth dorsal vertebræ, by the removal of the interspinous ligaments, portions of the *posterior external vertebral venous plexus have also been exposed.

Plexus venosi vertebrales interni—The internal vertebral venous plexus.


Basivertebral vein[5]
V. basivertebralis
Anterior longitudinal spinal vein, or longitudinal vertebral sinus[2]
Sinus vertebralis longitudinalis
*Anterior external vertebral venous plexus[1]
*Plexus venosus vertebralis externus anterior
Right ascending lumbar vein
V. lumbalis ascendens dextra
1/1
*Posterior external vertebral venous plexus[6]
*Plexus venosus vertebralis externus posterior
terior internal vertebral venous plexus[2]—*Plexus venosus vertebralis internus (anterior)
*Posterior internal vertebral venous plexus[3]—*Plexus venosus vertebralis internus (posterior)
*Venous rete of the vertebra[4]
*Rete venosum vertebræ

1 **Anterior External Vertebral Venous Plexus.*—Quain calls the veins that combine to form this plexus the *external veins of the bodies of the vertebræ.* According to Von Langer and Toldt, the *plexus venosi vertebrales externi anteriores* are not equally developed throughout the spine, being found only in the cervical and sacral regions. (See also Appendix, note 259.)—Tr.

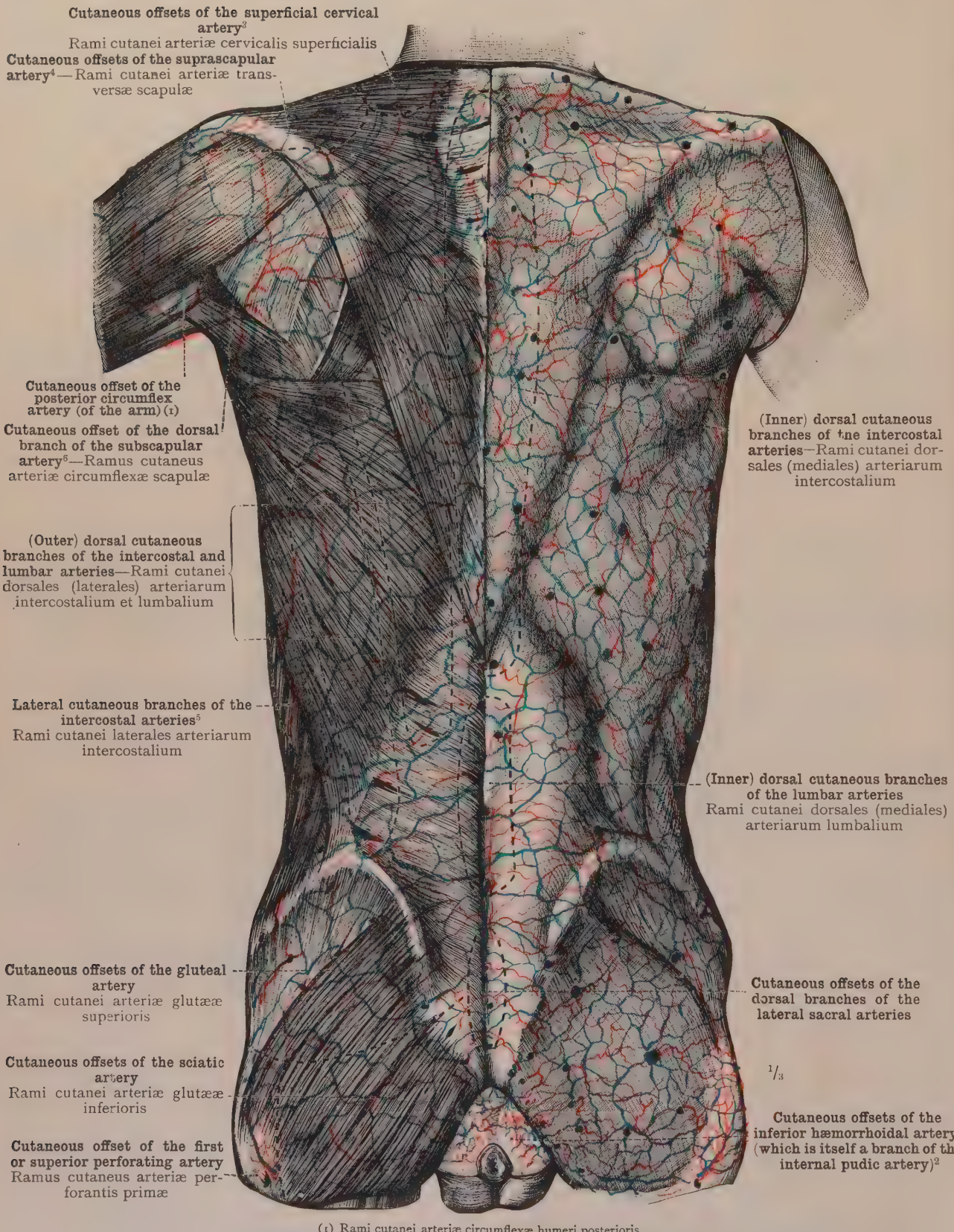
2 See Appendix, notes 259 and 267. 3 See Appendix, notes 259 and 263. 4 See Appendix, note 269.

5 See Appendix, note 268. 6 See Appendix, notes 259 and 260.

FIG. 1066.—THE BASIVERTEBRAL VEINS, VENÆ BASIVERTEBRALES, THEIR CONNEXION WITH THE *ANTERIOR INTERNAL AND THE *ANTERIOR EXTERNAL VERTEBRAL VENOUS PLEXUSES, *PLEXUS VENOSI VERTEBRALES ANTERIORES; AND THE *VENOUS RETE OF THE VERTEBRA, RETE VENOSUM VERTEBRÆ, A SEGMENTAL PORTION OF THE *ANTERIOR INTERNAL AND *POSTERIOR INTERNAL VERTEBRAL VENOUS PLEXUS, *PLEXUS VENOSI VERTEBRALES INTERNI; SEEN FROM ABOVE IN A HORIZONTAL SECTION THROUGH A LUMBAR VERTEBRA.

In order to bring into view the ramifications of the basivertebral veins at different levels, a part of the substance of the body of the vertebra was cut away below the general level of the section.

Vv. basivertebrales—The basivertebral veins.—Plexus venosi vertebrales—The vertebral venous plexuses.

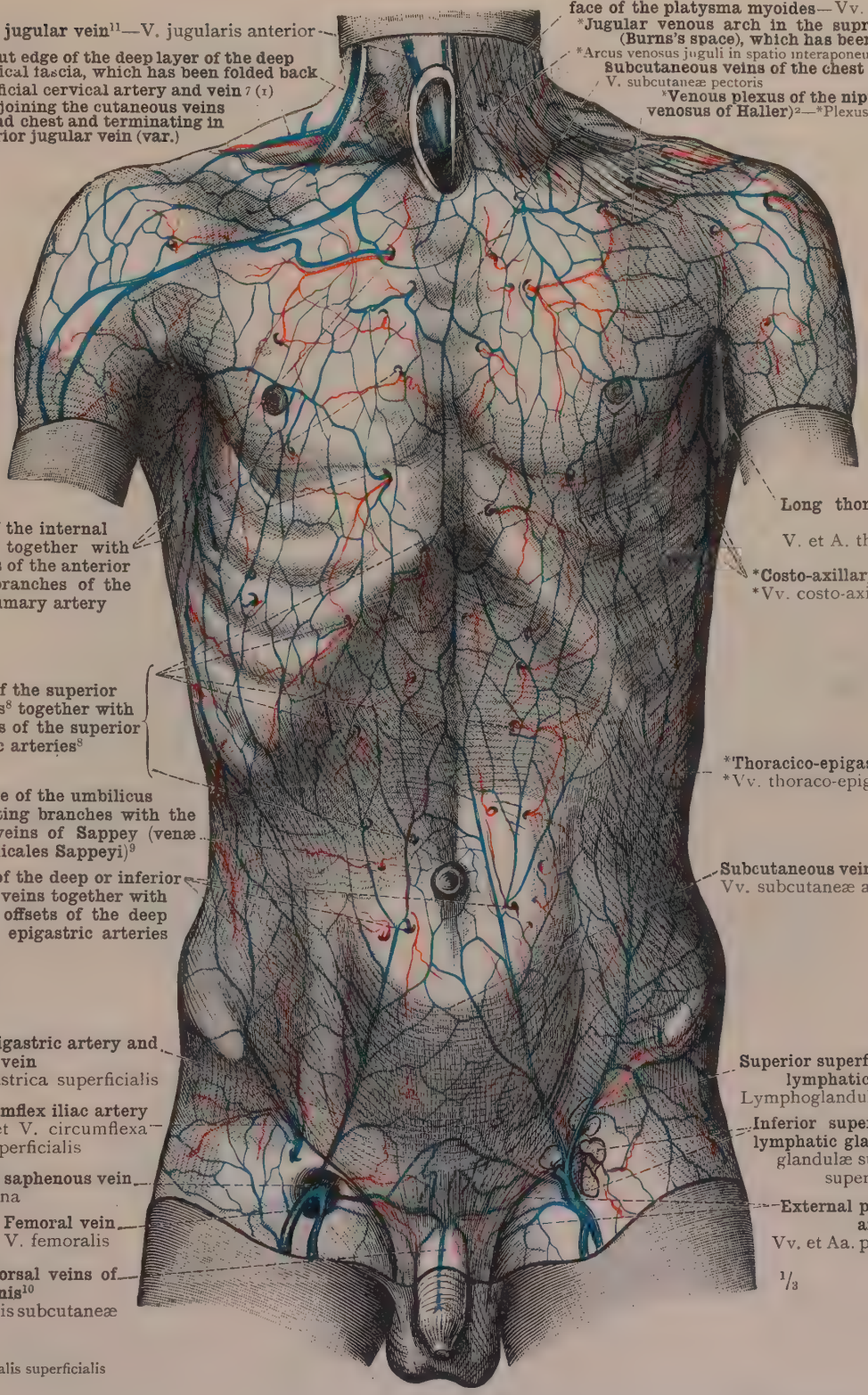

Cutaneous offsets of the superficial cervical artery[3]
Rami cutanei arteriæ cervicalis superficialis
Cutaneous offsets of the suprascapular artery[4]—Rami cutanei arteriæ transversæ scapulæ
Cutaneous offset of the posterior circumflex artery (of the arm) (1)
Cutaneous offset of the dorsal branch of the subscapular artery[6]—Ramus cutaneus arteriæ circumflexæ scapulæ
(Outer) dorsal cutaneous branches of the intercostal and lumbar arteries—Rami cutanei dorsales (laterales) arteriarum intercostalium et lumbalium
Lateral cutaneous branches of the intercostal arteries[5]
Rami cutanei laterales arteriarum intercostalium
Cutaneous offsets of the gluteal artery
Rami cutanei arteriæ glutææ superioris
Cutaneous offsets of the sciatic artery
Rami cutanei arteriæ glutææ inferioris
Cutaneous offset of the first or superior perforating artery
Ramus cutaneus arteriæ perforantis primæ
(Inner) dorsal cutaneous branches of the intercostal arteries—Rami cutanei dorsales (mediales) arteriarum intercostalium
(Inner) dorsal cutaneous branches of the lumbar arteries
Rami cutanei dorsales (mediales) arteriarum lumbalium
Cutaneous offsets of the dorsal branches of the lateral sacral arteries
1/3
Cutaneous offsets of the inferior hæmorrhoidal artery[1] (which is itself a branch of the internal pudic artery)[2]

(1) Rami cutanei arteriæ circumflexæ humeri posterioris

[1] Called by Macalister the *anal artery*. [2] See Appendix, note 139.
[3] Regarding the author's use of the term *arteria cervicalis superficialis*, see Appendix, notes 134, 135, 172, and 208.
[4] Called also the *transverse scapular* or *transverse humeral artery*.
[5] Known also as the *lateral perforating branches*. See note 1 to p. 589. [6] Or *dorsalis scapulæ artery*.

FIG. 1067.—THE SUBCUTANEOUS ARTERIES AND VEINS OF THE POSTERIOR WALL OF THE TRUNK.

The Subcutaneous Bloodvessels of the Posterior Wall of the Trunk.

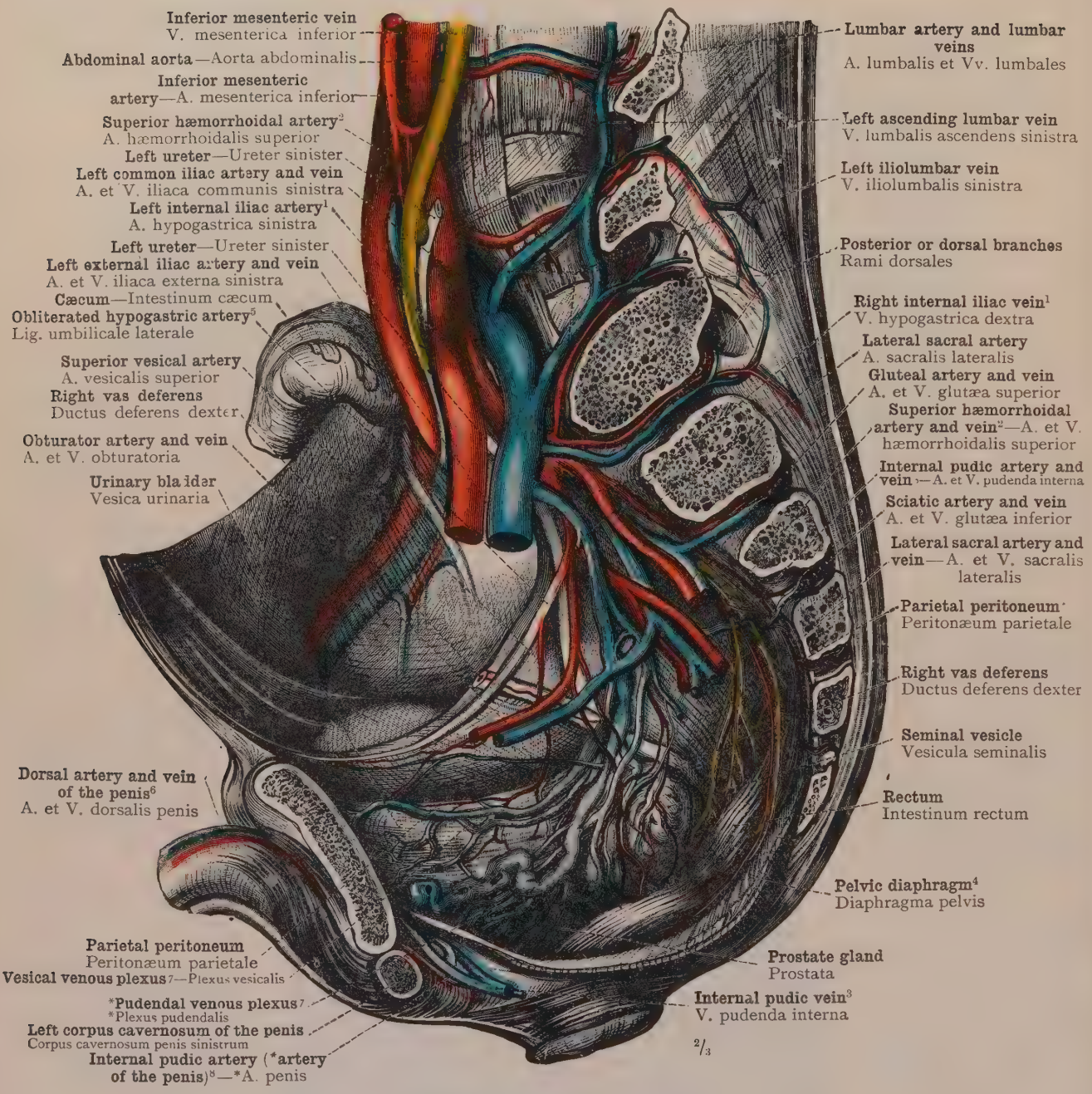


Subcutaneous veins of the neck on the outer surface of the platysma myoides—Vv. subcutaneæ colli
*Jugular venous arch in the suprasternal space (Burns's space), which has been opened [1]
*Arcus venosus juguli in spatio interaponeurotico suprasternale
Subcutaneous veins of the chest
V. subcutaneæ pectoris
*Venous plexus of the nipple (circulus venosus of Haller)[2]—*Plexus venosus mamillæ
Anterior jugular vein[11]—V. jugularis anterior
Cut edge of the deep layer of the deep cervical fascia, which has been folded back
Superficial cervical artery and vein [7] (1)
Cephalic vein joining the cutaneous veins of the neck and chest and terminating in the anterior jugular vein (var.)
Long thoracic artery and vein[3]
V. et A. thoracalis lateralis
Tributaries of the internal mammary vein together with cutaneous offsets of the anterior or perforating branches of the internal mammary artery
*Costo-axillary veins[4]
*Vv. costo-axillares
Tributaries of the superior epigastric veins[8] together with cutaneous offsets of the superior epigastric arteries[8]
*Thoracico-epigastric veins[4]
*Vv. thoraco-epigastricæ
*Venous circle of the umbilicus and communicating branches with the para-umbilical veins of Sappey (venæ parumbilicales Sappeyi)[9]
Tributaries of the deep or inferior epigastric veins together with cutaneous offsets of the deep or inferior epigastric arteries
Subcutaneous veins of the abdomen
Vv. subcutaneæ abdominis
Superficial epigastric artery and vein
A. et V. epigastrica superficialis
Superficial circumflex iliac artery and vein—A. et V. circumflexa ilium superficialis
Superior superficial inguinal lymphatic glands
Lymphoglandulæ inguinales
Inferior superficial inguinal lymphatic glands[5]—Lymphoglandulæ subinguinales superficiales
Internal or long saphenous vein
V. saphena magna
External pudic veins and arteries[6]
Vv. et Aa. pudendæ externæ
Femoral vein
V. femoralis
Subcutaneous dorsal veins of the penis[10]
Vv. dorsales penis subcutaneæ
1/3
(1) A. et V. cervicalis superficialis

1 See Appendix, note 123.
2 See Appendix, note 270.
3 Known also as the *external mammary artery* and *vein*.
4 See Appendix, note 271.
5 Often called the *femoral lymphatic glands*.
6 See Appendix, note 272.
7 See Appendix, notes 134, 135, 172, and 208.
8 The *superior epigastric* vessels are known also as the *abdominal* branches of the *internal mammary* vessels.
9 See Appendix, note 273.
10 See Appendix, note 274.
11 See Appendix, note 197.

FIG. 1068.—THE SUBCUTANEOUS ARTERIES AND VEINS OF THE ANTERIOR WALL OF THE TRUNK.

The Subcutaneous Bloodvessels of the Anterior Wall of the Trunk.

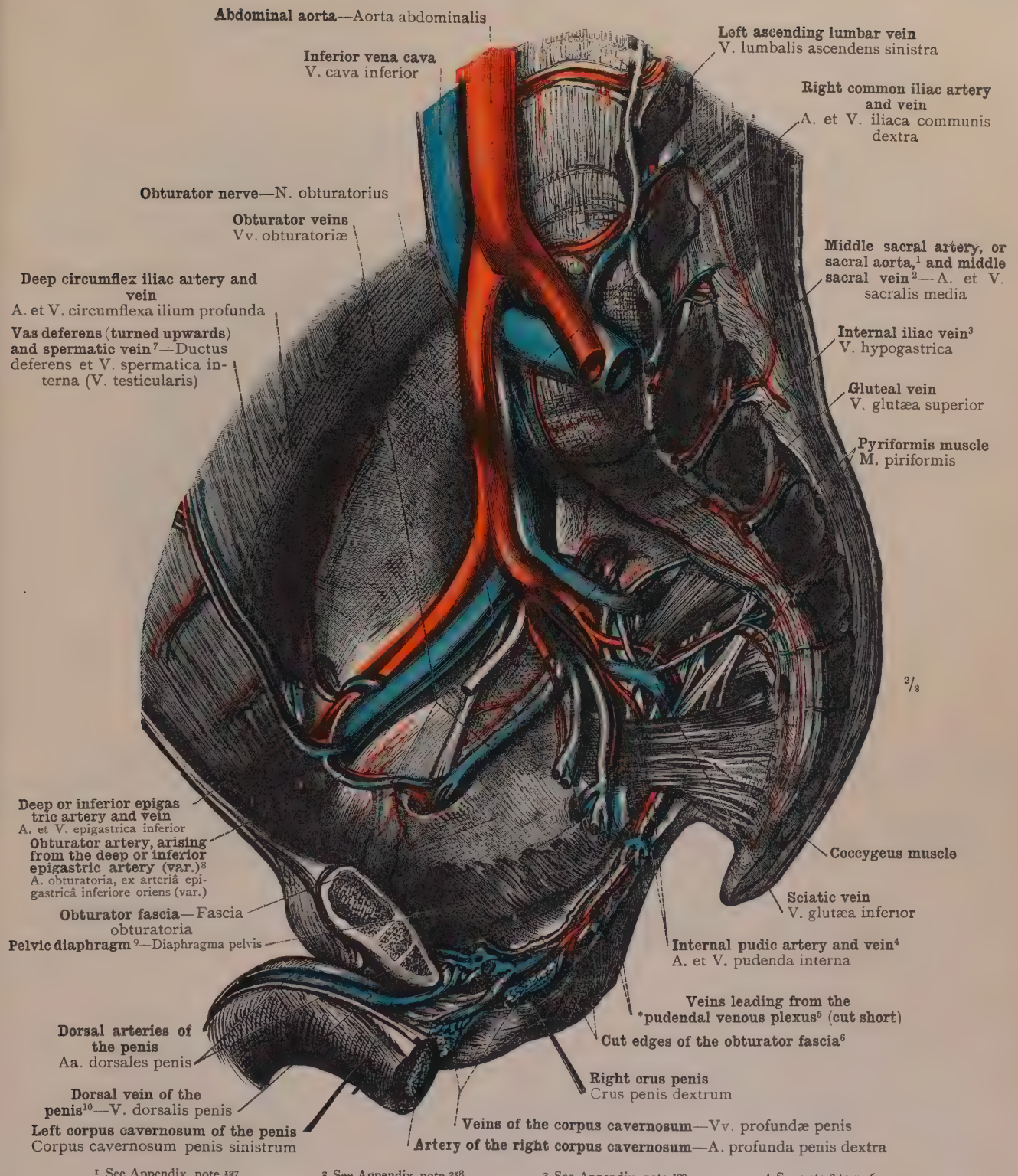


[1] See Appendix, note [120].
[2] Called by Macalister the *superior rectal artery* and *vein*.
[3] Regarding the nomenclature of the *internal pudic artery*, see Appendix, note [139]. The same considerations apply to the nomenclature of the companion *vein*.—Tr.
[4] See Appendix, note [140].
[5] Or **external umbilical ligament*. See Appendix, note [148].
[6] See Appendix, note [274].
[7] See Appendix, note [275].
[8] See Appendix, note [142].

FIG. 1069.—THE VENOUS PLEXUSES OF THE MALE PELVIS; SEEN FROM THE LEFT SIDE.

By a section, which began in front a little to the left of the median plane, and behind passed through the left row of sacral foramina, the left lateral wall of the pelvis was removed, the parietal peritoneum covering this wall being, however, retained up to the level of its reflection on to the urinary bladder and the rectum. The extraperitoneal portions of these organs were exposed, together with the vessels by which they are surrounded; the pelvic diaphragm (*see Appendix, note* [140]) was cut away close to the rectum and the bladder and drawn slightly downwards. The inferior mesenteric vein has been injected with a yellow material.

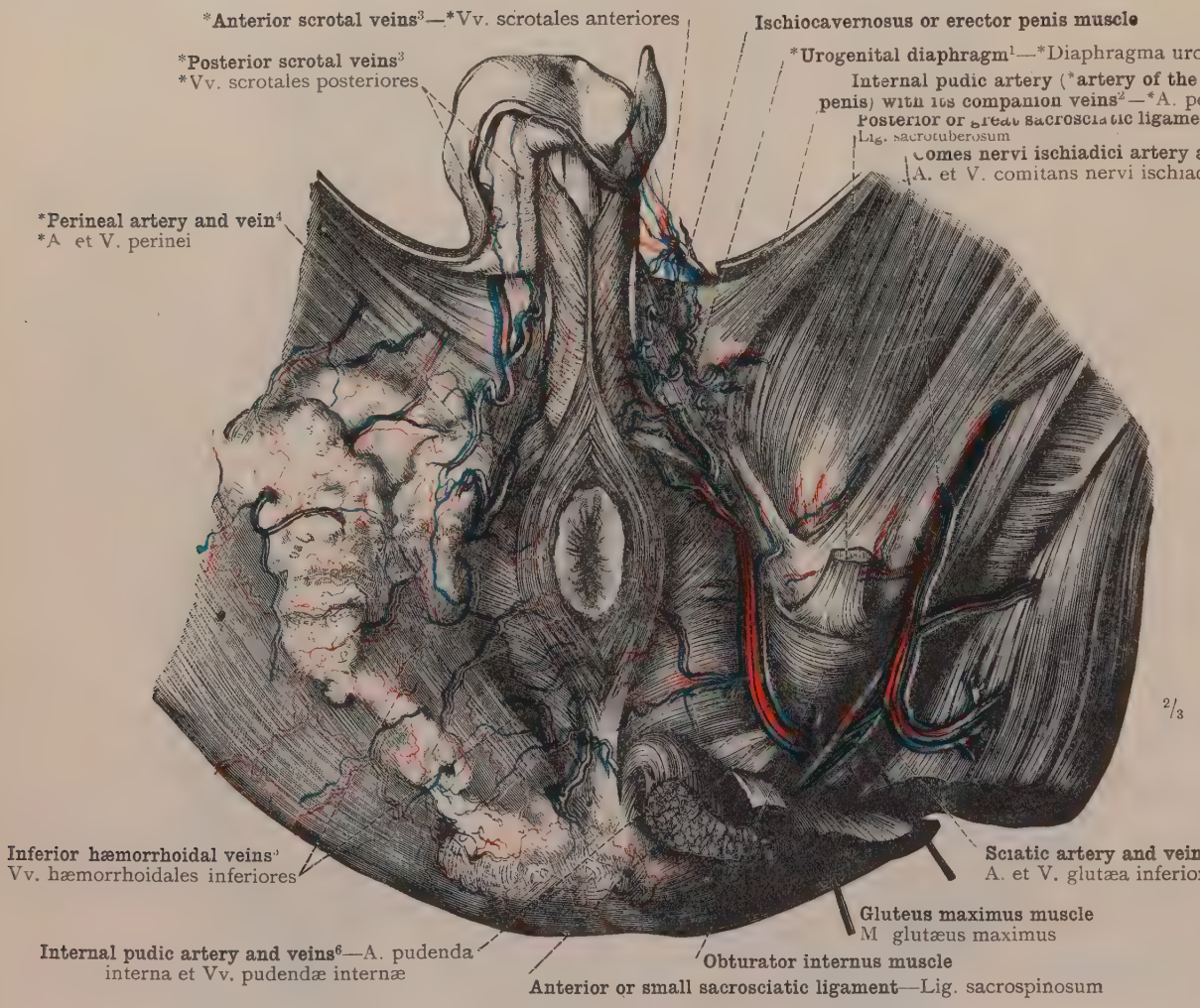
The Veins of the Male Pelvis.


Abdominal aorta—Aorta abdominalis
Inferior vena cava
V. cava inferior
Left ascending lumbar vein
V. lumbalis ascendens sinistra
Right common iliac artery and vein
A. et V. iliaca communis dextra
Obturator nerve—N. obturatorius
Obturator veins
Vv. obturatoriæ
Middle sacral artery, or sacral aorta,[1] **and middle sacral vein**[2]—A. et V. sacralis media
Deep circumflex iliac artery and vein
A. et V. circumflexa ilium profunda
Vas deferens (turned upwards) and spermatic vein[7]—Ductus deferens et V. spermatica interna (V. testicularis)
Internal iliac vein[3]
V. hypogastrica
Gluteal vein
V. glutæa superior
Pyriformis muscle
M. piriformis
2/3
Deep or inferior epigastric artery and vein
A. et V. epigastrica inferior
Obturator artery, arising from the deep or inferior epigastric artery (var.)[8]
A. obturatoria, ex arteriâ epigastricâ inferiore oriens (var.)
Coccygeus muscle
Obturator fascia—Fascia obturatoria
Pelvic diaphragm[9]—Diaphragma pelvis
Sciatic vein
V. glutæa inferior
Internal pudic artery and vein[4]
A. et V. pudenda interna
Veins leading from the pudendal venous plexus[5] **(cut short)**
Cut edges of the obturator fascia[6]
Dorsal arteries of the penis
Aa. dorsales penis
Right crus penis
Crus penis dextrum
Dorsal vein of the penis[10]—V. dorsalis penis
Left corpus cavernosum of the penis
Corpus cavernosum penis sinistrum
Veins of the corpus cavernosum—Vv. profundæ penis
Artery of the right corpus cavernosum—A. profunda penis dextra

1 See Appendix, note 127. 2 See Appendix, note 258. 3 See Appendix, note 120. 4 See note 3 to p. 672.
5 See Appendix, note 275. 6 See Appendix, note 276. 7 See Appendix, note 277. 8 See Appendix, note 278.
9 See Appendix, note 140. 10 See Appendix, note 274.

FIG 1070.—THE VEINS OF THE RIGHT LATERAL WALL OF THE PELVIS AND OF THE MALE EXTERNAL GENITAL ORGANS. SEEN FROM THE LEFT SIDE

The Veins of the Male Pelvis.

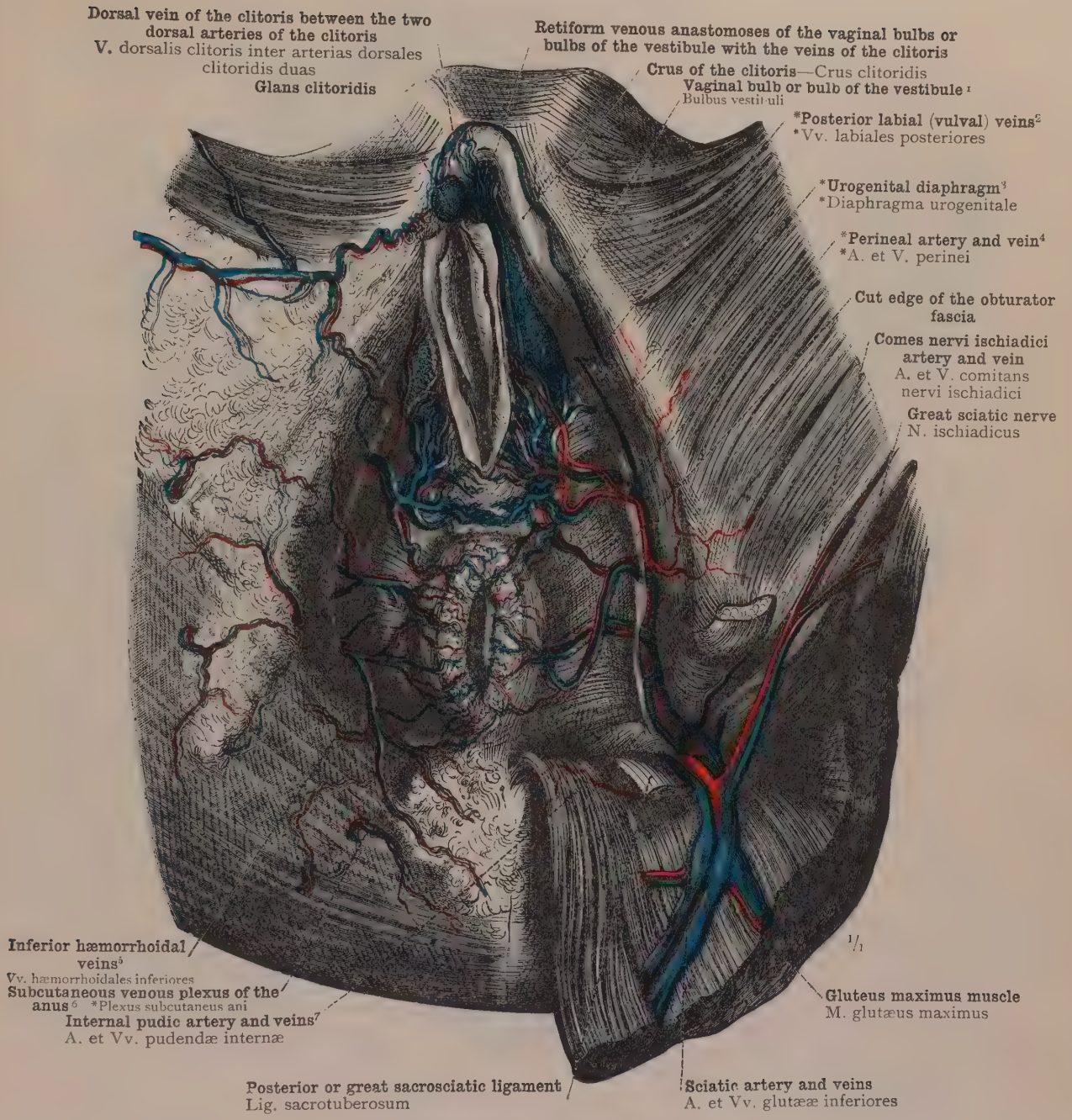

*Anterior scrotal veins[3]—*Vv. scrotales anteriores
*Posterior scrotal veins[3]
*Vv. scrotales posteriores
Ischiocavernosus or erector penis muscle
*Urogenital diaphragm[1]—*Diaphragma urogenitale
Internal pudic artery (*artery of the penis) with its companion veins[2]—*A. penis
Posterior or great sacrosciatic ligament
Lig. sacrotuberosum
Comes nervi ischiadici artery and vein
A. et V. comitans nervi ischiadici
*Perineal artery and vein[4]
*A. et V. perinei
2/3
Inferior hæmorrhoidal veins[5]
Vv. hæmorrhoidales inferiores
Sciatic artery and vein
A. et V. glutæa inferior
Gluteus maximus muscle
M. glutæus maximus
Internal pudic artery and veins[6]—A. pudenda interna et Vv. pudendæ internæ
Obturator internus muscle
Anterior or small sacrosciatic ligament—Lig. sacrospinosum

[1] See Appendix, note [142]. [2] See Appendix, note [141]. [3] See Appendix, note [138].
[4] Regarding the artery called by the author *arteria perinei, see Appendix, notes [147] and [149]. The same considerations apply to the nomenclature of the companion vein.—TR.
[5] The same considerations apply regarding the nomenclature of these veins as regarding that of the artery they accompany. See Appendix, note [150].
[6] See Appendix, note [139].

FIG. 1071.—THE SUPERFICIAL AND DEEP VEINS OF THE MALE PERINEAL REGION.

On the right side of the body the superficial bloodvessels were dissected out and the subcutaneous fat was partially preserved. On the left side of the body the gluteus maximus muscle and the posterior or great sacrosciatic ligament (ligamentum sacrotuberosum) were cut across and the segments were drawn apart, in order to display the passage of the internal pudic artery and veins through the small sacrosciatic foramen (foramen ischiadicum minus); these vessels were also exposed in the outer wall of the ischiorectal fossa. The left testis was removed, in order to lay bare the *anterior scrotal veins and their anastomoses with the *posterior scrotal veins.

The Veins of the Male Perineal Region.

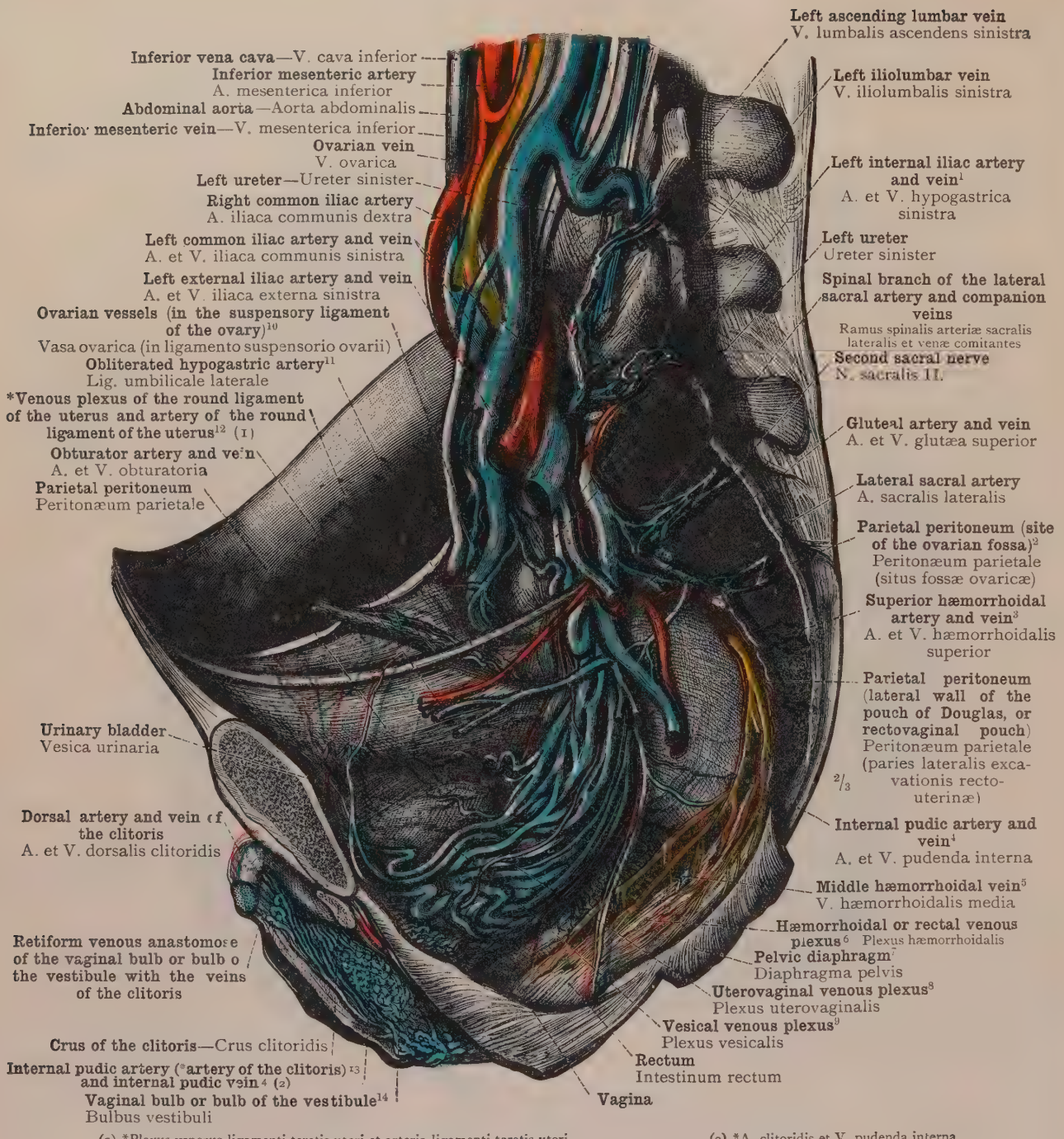

Dorsal vein of the clitoris between the two dorsal arteries of the clitoris
V. dorsalis clitoris inter arterias dorsales clitoridis duas
Glans clitoridis
Retiform venous anastomoses of the vaginal bulbs or bulbs of the vestibule with the veins of the clitoris
Crus of the clitoris—Crus clitoridis
Vaginal bulb or bulb of the vestibule [1]
Bulbus vestibuli
*Posterior labial (vulval) veins [2]
*Vv. labiales posteriores
*Urogenital diaphragm [3]
*Diaphragma urogenitale
*Perineal artery and vein [4]
*A. et V. perinei
Cut edge of the obturator fascia
Comes nervi ischiadici artery and vein
A. et V. comitans nervi ischiadici
Great sciatic nerve
N. ischiadicus
1/1
Inferior hæmorrhoidal veins [5]
Vv. hæmorrhoidales inferiores
Subcutaneous venous plexus of the anus [6] *Plexus subcutaneus ani
Internal pudic artery and veins [7]
A. et Vv. pudendæ internæ
Gluteus maximus muscle
M. glutæus maximus
Posterior or great sacrosciatic ligament
Lig. sacrotuberosum
Sciatic artery and veins
A. et Vv. glutææ inferiores

[1] See Appendix to Part IV., note 91.
[2] See Appendix, note 138.
[3] See Appendix, note 142.
[4] See note 4 to p. 675.
[5] See note 5 to p. 674.
[6] See Appendix, note 279.
[7] See note 3 to p. 672.

FIG. 1072.—THE SUPERFICIAL AND DEEP VEINS OF THE FEMALE PERINEAL REGION. THE INFERIOR HÆMORRHOIDAL VEINS (*see note* [5] *to p.* 674), VENÆ HÆMORRHOIDALES INFERIORES; THE *SUBCUTANEOUS VENOUS PLEXUS OF THE ANUS (*see Appendix, note* [279]), *PLEXUS SUBCUTANEUS ANI; THE INTERNAL PUDIC VEINS (*see note* [3] *to p.* 672), VENÆ PUDENDÆ INTERNÆ; THE *POSTERIOR LABIAL (OR VULVAL) VEINS (*see Appendix, note* [138]), VENÆ LABIALES POSTERIORES: THE DORSAL VEINS OF THE CLITORIS, VENÆ DORSALES CLITORIDIS, AND THE VAGINAL BULB OR BULB OF THE VESTIBULE (*see note* [1] *above*), BULBUS VESTIBULI.

On the right side of the body, the superficial vessels were dissected out. On the left side of the body, the gluteus maximus muscle and the posterior or great sacrosciatic ligament were cut across and the segments were widely separated; by cutting through the obturator fascia where it covers the internal pudic vessels in the outer wall of the ischiorectal fossa, these vessels were exposed in their passage through Alcock's canal (*see Appendix, notes* [145] *and* [151]). The sphincter vaginæ or bulbocavernosus muscle was removed, together with the anterior extremity of the levator ani muscle, in order to lay bare the vaginal bulbs or bulbs of the vestibule (*see note* [1] *above*) and the transverse anastomoses of the veins that drain the blood away from these structures.

The Veins of the Female Perineal Region.


Left ascending lumbar vein
V. lumbalis ascendens sinistra
Inferior vena cava—V. cava inferior
Inferior mesenteric artery
A. mesenterica inferior
Abdominal aorta—Aorta abdominalis
Inferior mesenteric vein—V. mesenterica inferior
Ovarian vein
V. ovarica
Left ureter—Ureter sinister
Right common iliac artery
A. iliaca communis dextra
Left common iliac artery and vein
A. et V. iliaca communis sinistra
Left external iliac artery and vein
A. et V. iliaca externa sinistra
Ovarian vessels (in the suspensory ligament of the ovary)[10]
Vasa ovarica (in ligamento suspensorio ovarii)
Obliterated hypogastric artery[11]
Lig. umbilicale laterale
*Venous plexus of the round ligament of the uterus and artery of the round ligament of the uterus[12] (1)
Obturator artery and vein
A. et V. obturatoria
Parietal peritoneum
Peritonæum parietale
Left iliolumbar vein
V. iliolumbalis sinistra
Left internal iliac artery and vein[1]
A. et V. hypogastrica sinistra
Left ureter
Ureter sinister
Spinal branch of the lateral sacral artery and companion veins
Ramus spinalis arteriæ sacralis lateralis et venæ comitantes
Second sacral nerve
N. sacralis II.
Gluteal artery and vein
A. et V. glutæa superior
Lateral sacral artery
A. sacralis lateralis
Parietal peritoneum (site of the ovarian fossa)[2]
Peritonæum parietale (situs fossæ ovaricæ)
Superior hæmorrhoidal artery and vein[3]
A. et V. hæmorrhoidalis superior
Parietal peritoneum (lateral wall of the pouch of Douglas, or rectovaginal pouch)
Peritonæum parietale (paries lateralis excavationis rectouterinæ)
2/3
Urinary bladder
Vesica urinaria
Dorsal artery and vein of the clitoris
A. et V. dorsalis clitoridis
Internal pudic artery and vein[4]
A. et V. pudenda interna
Middle hæmorrhoidal vein[5]
V. hæmorrhoidalis media
Hæmorrhoidal or rectal venous plexus[6] Plexus hæmorrhoidalis
Retiform venous anastomose of the vaginal bulb or bulb o the vestibule with the veins of the clitoris
Pelvic diaphragm[7]
Diaphragma pelvis
Uterovaginal venous plexus[8]
Plexus uterovaginalis
Vesical venous plexus[9]
Plexus vesicalis
Crus of the clitoris—Crus clitoridis
Internal pudic artery (*artery of the clitoris)[13] and internal pudic vein[4] (2)
Rectum
Intestinum rectum
Vaginal bulb or bulb of the vestibule[14]
Bulbus vestibuli
Vagina

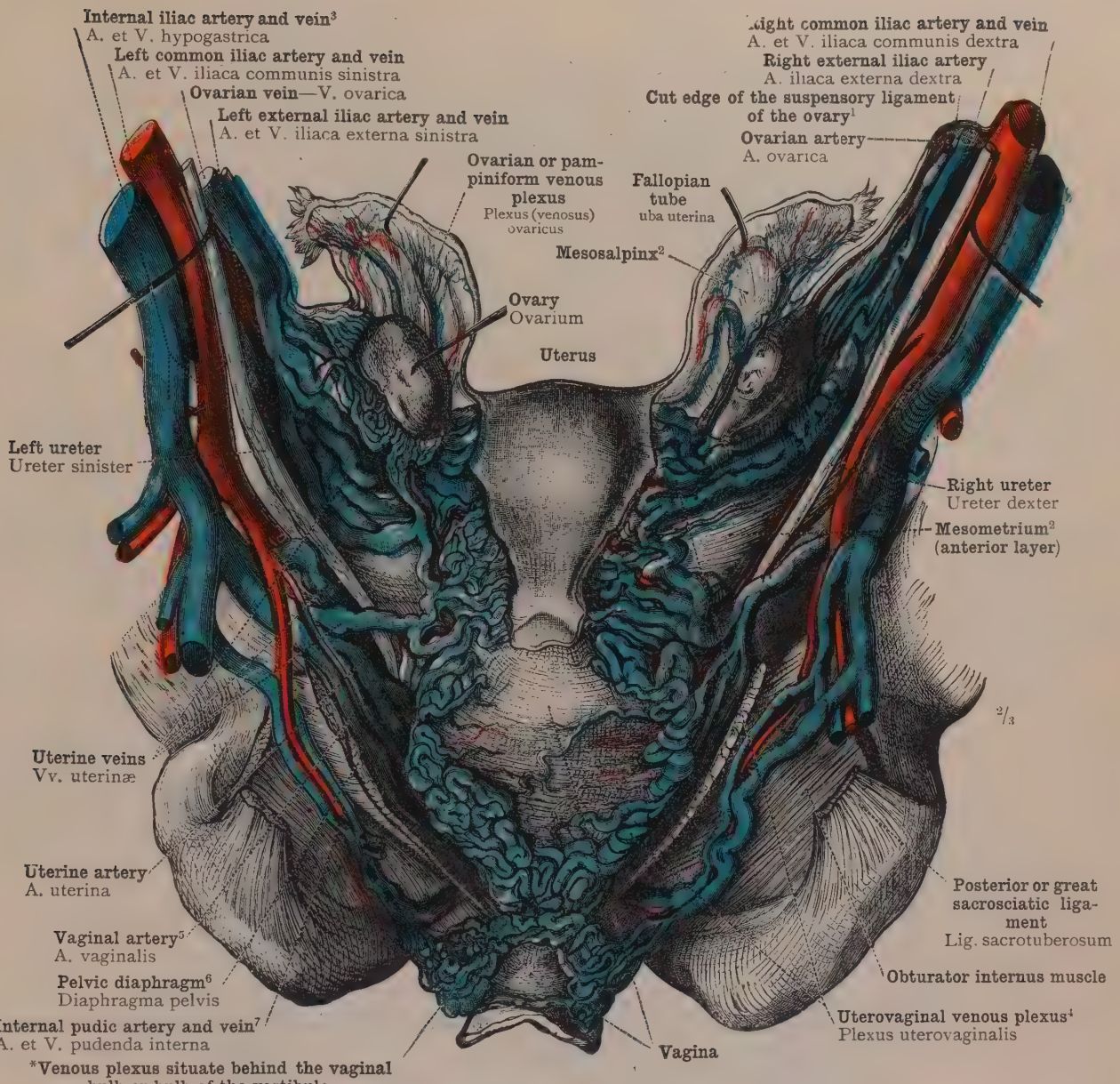
(1) *Plexus venosus ligamenti teretis uteri et arteria ligamenti teretis uteri (2) *A. clitoridis et V. pudenda interna

[1] See Appendix, note [120].
[2] A description of the *ovarian fossa* or *fovea* (*fossa ovarii*, Quain) is given in the Appendix to Part IV., note [79].—Tr.
[3] Called by Macalister the *superior rectal artery* and *vein*.
[4] See note 3 to p 672.
[5] Called by Macalister the *middle rectal vein*.
[6] See Appendix, note [280].
[7] See Appendix, note [140].
[8] See Appendix, note [281].
[9] See Appendix, note [275].
[10] This ligament is known also as the *infundibulopelvic* or *ovariopelvic fold* or *ligament*.
[11] Or *external umbilical ligament*. See Appendix, note [148].
[12] The homologues in the female of the *cremasteric vein* and *artery*, respectively, in the male.—Tr.
[13] See Appendix, note [156].
[14] See Appendix to Part IV., note [91].

FIG. 1073.—THE OVARIAN VEIN, VENA OVARICA; THE VESICAL VENOUS PLEXUS (*see Appendix, note* [275]), PLEXUS VESICALIS, AND THE UTEROVAGINAL PLEXUS (*see Appendix, note* [280]), PLEXUS UTEROVAGINALIS; THE *VENOUS PLEXUS OF THE ROUND LIGAMENT OF THE UTERUS (*see note* [12] *above*), *PLEXUS VENOSUS LIGAMENTI TERETIS UTERI. THE SUPERIOR AND MIDDLE HÆMORRHOIDAL (OR RECTAL) VEINS, VENÆ HÆMORRHOIDALES SUPERIOR ET MEDIA; HÆMORRHOIDAL VENOUS PLEXUS, PLEXUS HÆMORRHOIDALIS. THE VENOUS PLEXUSES THAT SURROUND THE SPINAL BRANCHES OF THE ILIOLUMBAR AND LATERAL SACRAL ARTERIES.

By a section, which in front passed near the median plane, and behind through the left row of sacral foramina, the left lateral wall of the pelvis was removed; but the parietal peritoneal investment of this wall was preserved up to its reflection on to the urinary bladder, the vagina, and the rectum. The parts of these organs situate outside the peritoneum were laid bare in so far as this was possible without removing the adjacent venous plexuses. The pelvic diaphragm was turned downwards.

The Veins of the Female Pelvis.

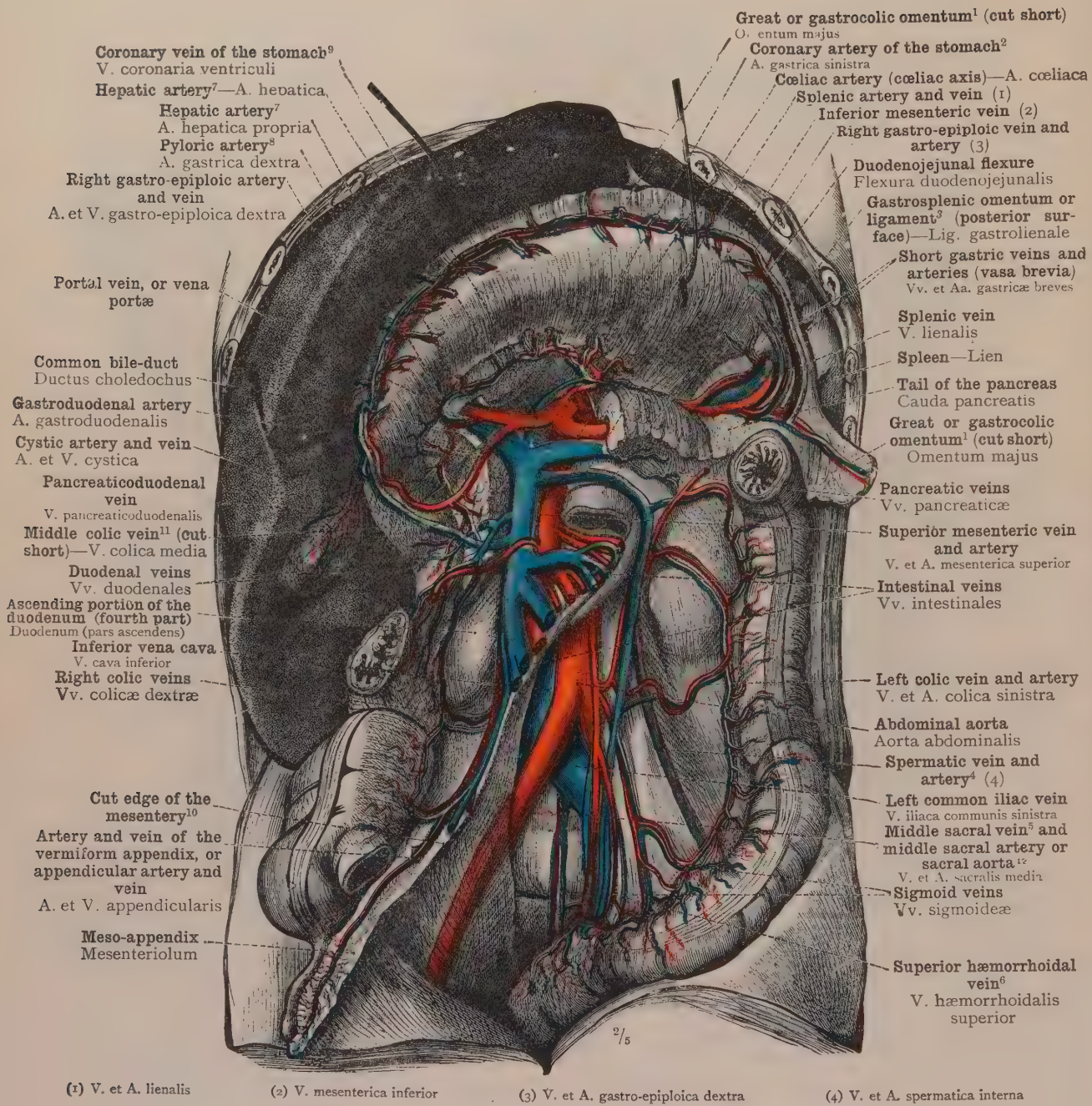


1 Known also as the *infundibulopelvic* or *ovariopelvic fold* or *ligament*.
2 See Appendix to Part IV., note 82.
3 See Appendix, note 120.
4 See Appendix, note 282.
5 See Appendix, note 163.
6 See Appendix, note 140.
7 See note 3 to p. 672

FIG. 1074.—THE VEINS OF THE UTERUS, THE VAGINA, THE OVARIES, AND THE FALLOPIAN TUBES, SEEN FROM BEHIND: THE OVARIAN VEIN, VENA OVARICA, CONTINUED INTO THE OVARIAN OR PAMPINIFORM VENOUS PLEXUS, PLEXUS VENOSUS OVARICUS, AND HAVING FREE CONNEXIONS WITH THE UTERINE VEINS, VENÆ UTERINÆ, AND THE UTEROVAGINAL VENOUS PLEXUS (*see Appendix, note* 281), PLEXUS UTEROVAGINALIS. THE INTERNAL PUDIC VEIN, AND ITS CONNEXIONS WITH THE VENOUS PLEXUS SITUATE BEHIND THE VAGINAL BULB OR BULB OF THE VESTIBULE.

The posterior half of the pelvis, together with the rectum and the posterior layer of the mesometrium, having been removed by a coronal section passing just behind the spine of the ischium, the uterovaginal plexus, with the veins leading from it, was laid bare. The ovaries were drawn well upwards, in order to spread out their mesentery; the left ovary was also drawn somewhat inwards, so as to display, after the outer layer of the mesovarium had been removed, the ovarian or pampiniform venous plexus, plexus (venosus) ovaricus. The common iliac vessels and the ureters were drawn outwards on each side. The internal pudic vessels were fully exposed by the removal of the obturator fascia where it covers them as they pass along the outer wall of the ischiorectal fossa.

The Veins of the Female Pelvis.



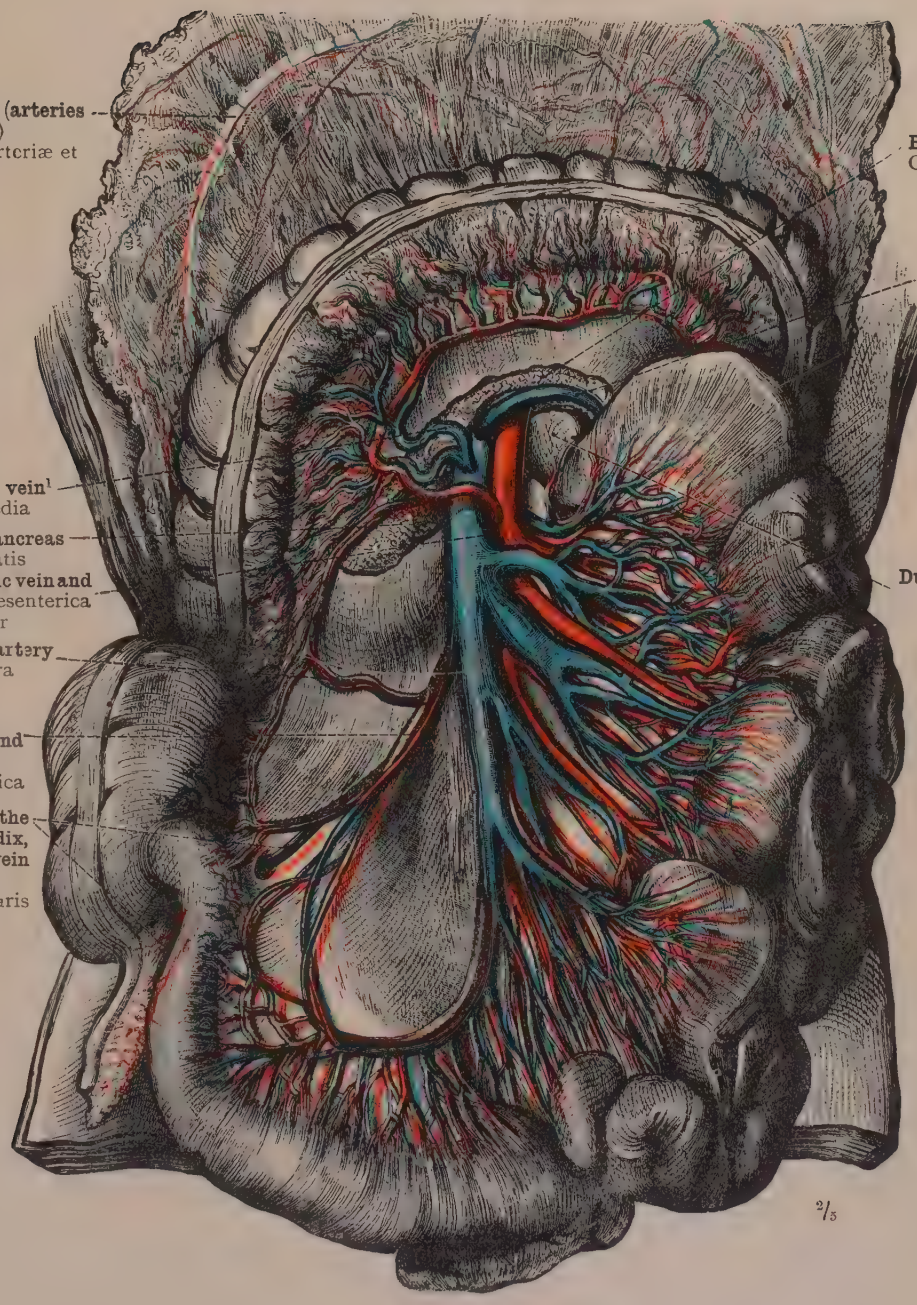
(1) V. et A. lienalis (2) V. mesenterica inferior (3) V. et A. gastro-epiploica dextra (4) V. et A. spermatica interna

[1] Or *epiploon*. [2] Called by Macalister the *gastric artery*.
[3] The *gastrosplenic omentum* is connected below with the *great* omentum, and is often regarded as a part of it.—Tr.
[4] See Appendix, note [277]. [5] See Appendix, note [258]. [6] Called by Macalister the *superior rectal vein*.
[7] See Appendix, note [130]. [8] Called by Macalister the *superior pyloric artery*. See Appendix, note [131].
[9] Called by Macalister the *gastric vein*.
[10] *I.e.*, the *mesentery of the jejunum and ileum*, which is always denoted in England by the term *mesentery* when used without qualification.—Tr.
[11] Called by Macalister the *transverse colic vein*. [12] See Appendix, note [127].

FIG. 1075.—FORMATION OF THE PORTAL VEIN OR VENA PORTÆ BY THE CONFLUENCE OF THE SUPERIOR AND INFERIOR MESENTERIC VEINS, VENÆ MESENTERICÆ SUPERIOR ET INFERIOR, THE SPLENIC VEIN, VENA LIENALIS, AND THE CORONARY VEIN OF THE STOMACH OR GASTRIC VEIN, VENA CORONARIA VENTRICULI.

The great or gastrocolic omentum (or epiploon) was cut away immediately below the great curvature of the stomach, and the stomach itself was turned upwards. The jejunum and the ileum, as well as the transverse colon and the upper half of the ascending colon, were cut away, and the mesentery (*see note* [10] *above*) was cut away close to its root. The cæcum was drawn outwards, in order to stretch the meso-appendix and to display the artery and vein of the vermiform appendix (appendicular artery and vein—arteria et vena appendicularis) between its layers. By the partial removal of the pancreas, the confluence of the superior mesenteric vein, vena mesenterica superior, and the splenic vein, vena lienalis, was displayed. The abdominal aorta, the inferior vena cava, the middle sacral artery or sacral aorta, and the middle sacral vein, were exposed by the removal of the parietal peritoneum covering these vessels.

The Portal System of Veins.


Epiploic branches (arteries and veins)
Rami epiploici (arteriæ et venæ)
Body of the pancreas
Corpus pancreatis
Inferior mesenteric vein
V. mesenterica inferior
Middle colic vein[1]
V. colica media
Head of the pancreas
Caput pancreatis
Superior mesenteric vein and artery—V. et A. mesenterica superior
Duodenojejunal flexure
Flexura duodenojejunalis
Right colic vein and artery
V. et A. colica dextra
Ileocolic vein and artery
V. et A. ileocolica
Vein and artery of the vermiform appendix, or appendicular vein and artery
V. et A. appendicularis
2/5

[1] Called by Macalister the *transverse colic vein.*

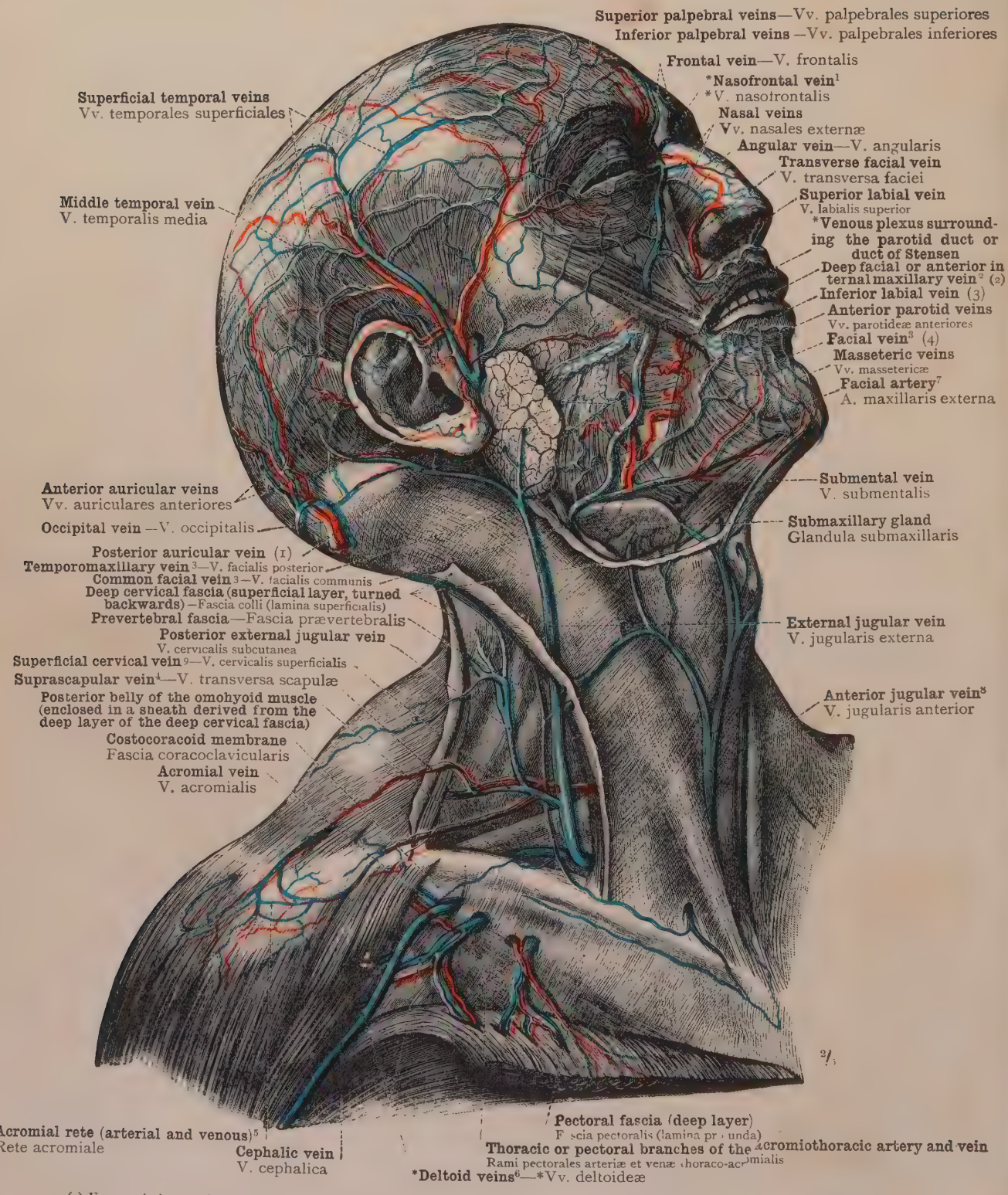
FIG. 1076.—THE TRIBUTARIES OF THE SUPERIOR MESENTERIC VEIN, VENA MESENTERICA SUPERIOR, AND THE TERMINAL PORTION OF THE INFERIOR MESENTERIC VEIN, VENA MESENTERICA INFERIOR. SEEN FROM BEFORE.

The jejunum (intestinum jejunum) and the ileum (intestinum ileum), with the mesentery (*see note* [10] *to p.* 678), were drawn to the left; the colon and the transverse mesocolon (mesocolon transversum), with the adjoining portion of the great or gastrocolic omentum (or epiploon), were drawn upwards.

V. mesenterica superior—The superior mesenteric vein.

VENÆ COLLI ET CAPITIS

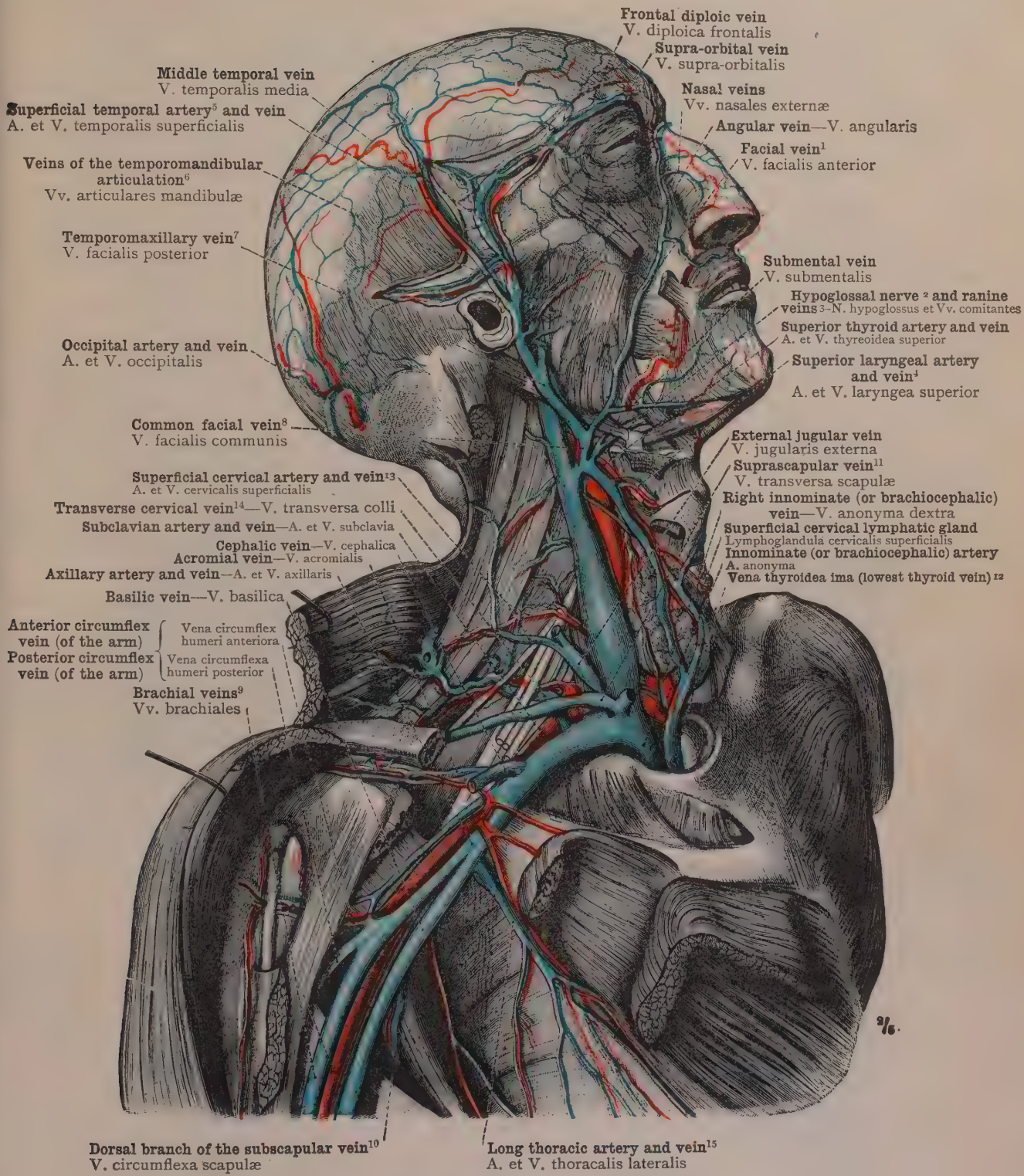
THE VEINS OF THE HEAD AND NECK



(1) V. auricularis posterior (2) V. anastomotica facialis (3) V. labialis inferior (4) V. facialis anterior

[1] See Appendix, note 282. [2] This vein is a communicating branch from the *pterygoid venous plexus*. [3] See Appendix, note 283.
[4] Known also as the *transverse scapular* or *transverse humeral vein*. [5] See Appendix, note 170. [6] See Appendix, note 284.
[7] See Appendix, note 166. [8] See Appendix, note 197. [9] See Appendix, note 285.

FIG. 1077.—THE SUPERFICIAL VEINS OF THE HEAD AND NECK: THE ORIGIN OF THE FACIAL (OR ANTERIOR FACIAL) VEIN, VENA FACIALIS ANTERIOR, AND THE TEMPOROMAXILLARY (OR POSTERIOR FACIAL) VEIN, VENA FACIALIS POSTERIOR (*see Appendix, note* 283); THE OCCIPITAL VEIN, VENA OCCIPITALIS; THE ANTERIOR AND EXTERNAL JUGULAR VEINS, VENÆ JUGULARES ANTERIOR ET EXTERNA; THE POSTERIOR EXTERNAL JUGULAR VEIN, VENA CERVICALIS SUBCUTANEA.



[1] Sometimes distinguished as the *anterior facial vein.* See Appendix, note [283].
[2] *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; sometimes also known as the *lingual motor nerve.*
[3] See Appendix, note [286]. [4] Or *laryngeal branches* of the *superior thyroid artery* and *vein*, respectively.
[5] See Appendix, note [168]. [6] See Appendix, note [287]. [7] Sometimes called the *posterior facial vein.* See Appendix, note [283].
[8] See Appendix, note [283]. [9] Or *venæ comites of the brachial artery.* [10] Often called the *dorsalis scapulæ* vein.
[11] Known also as the *transverse scapular* or *transverse humeral vein.* [12] Companion to the *thyroidea ima artery.* See note [1] to p. 590.
[13] See Appendix, note [285]. [14] See Appendix, note [262]. [15] Known also as the *external mammary artery* and *vein.*

FIG. 1078.—THE FACIAL VEIN (*see note* [1] *above*), VENA FACIALIS ANTERIOR; THE FORMATION OF THE TEMPOROMAXILLARY VEIN (*see note* [7] *above*), VENA FACIALIS POSTERIOR; THE INTERNAL JUGULAR VEIN, VENA JUGULARIS INTERNA; THE AXILLARY VEIN, VENA AXILLARIS. SEEN FROM THE RIGHT SIDE AND BEFORE.

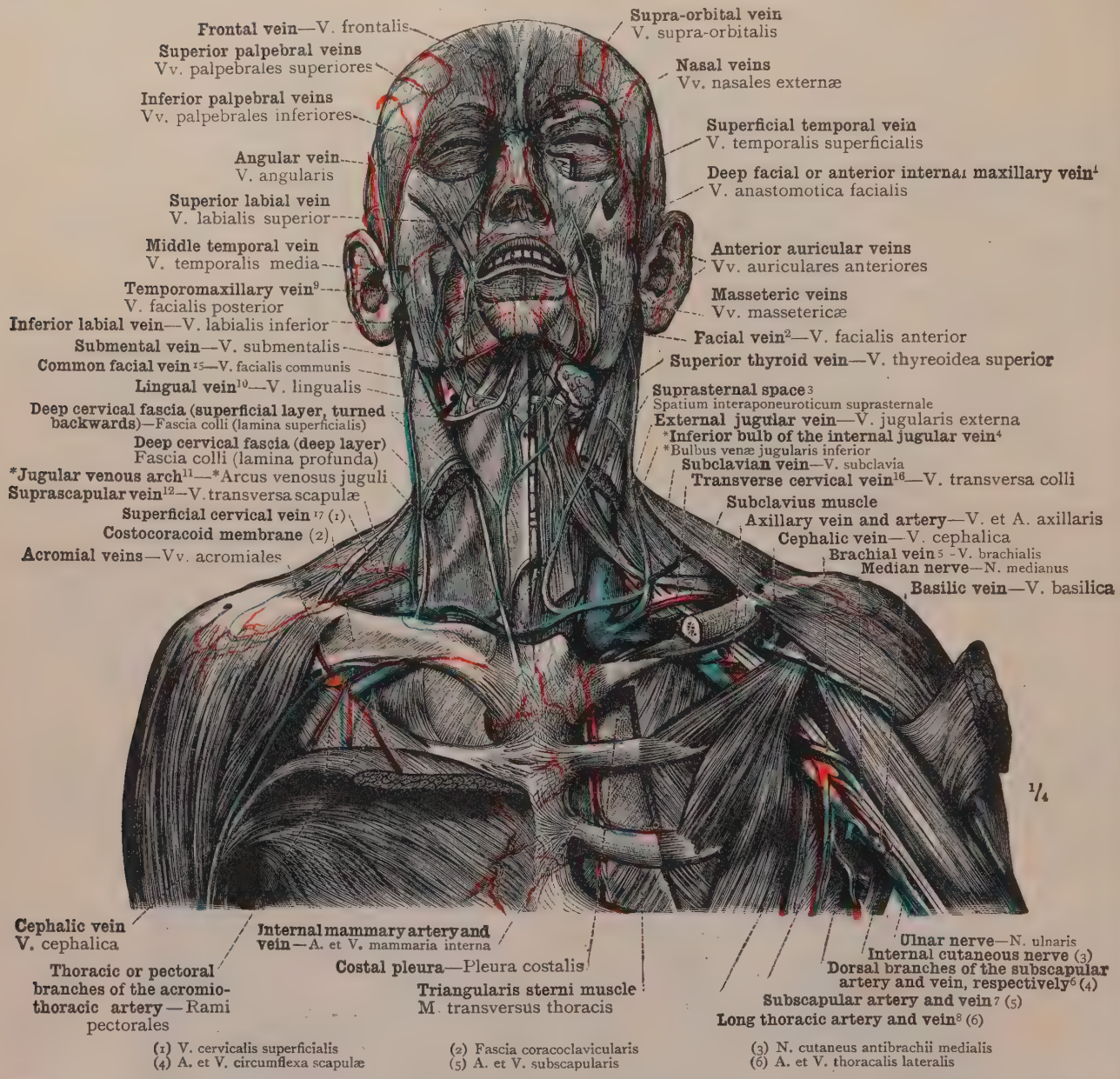
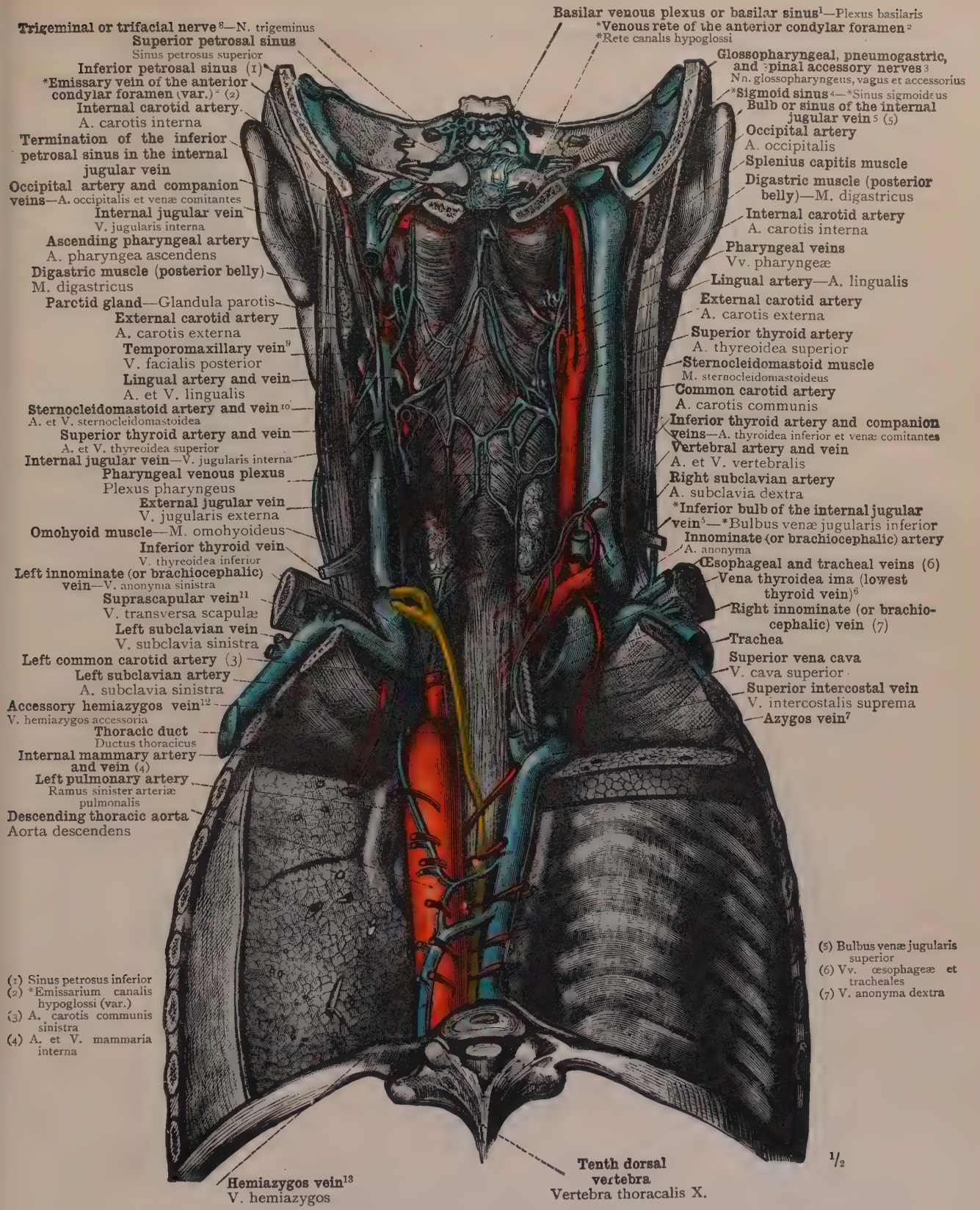


FIG. 1079.—THE SUPERFICIAL VEINS OF THE FACE, THE SUPERFICIAL AND DEEP VEINS OF THE NECK, AND THE VEINS OF THE AXILLA; SEEN FROM BEFORE.

On the right side of the neck, by the removal of the superficial layer of the deep cervical fascia, the *submaxillary fossa (*fossa submaxillaris—*see note* [13] *below*), the *greater supraclavicular fossa (fossa supraclavicularis major—*see note* [14] *below*), and the suprasternal space (spatium interaponeuroticum suprasternale—*see note* [3] *below*), were opened. The lower half of the right sternocleidomastoid muscle was removed, together with the corresponding portion of the superficial layer of the deep cervical fascia, in order to lay bare the opening of the *jugular venous arch (*see Appendix, note* [123]) into the terminal portion of the external jugular vein. On the left side of the neck the ensheathing portion of the deep cervical fascia was entirely removed, and the lower half of the sternocleidomastoid muscle was removed, together with the sternal extremity of the clavicle, in order to display the deep venous trunks and the left *venous angle (*angulus venosus—*see Appendix, note* [125]). On the right side of the body, the clavicular portion of the pectoralis major muscle has been turned downwards, thus exposing the axillary vein above the pectoralis minor muscle. On the left side of the body, the pectoralis major muscle having been removed, the vessels and nerves of the axilla were dissected out. Further, on this side, by the partial removal of the anterior or external intercostal aponeuroses and of the internal intercostal muscles, the internal mammary vessels were exposed, and their relation to the costal pleura and to the triangularis sterni muscle was displayed.

[1] See note [2] to p. 682. [2] Sometimes distinguished as the *anterior facial vein.* See Appendix, note [283]
[3] Called by Macalister *Burns's space.* [4] See Appendix, note [121]. [5] Or *vena comes of the brachial artery.*
[6] Known also as the *dorsalis scapulæ artery* and *vein*, respectively. [7] See Appendix, note [203].
[8] Known also as the *external mammary artery* and vein. [9] Sometimes called the *posterior facial vein.* See Appendix, note [283].
[10] Or *vena comes of the lingual artery.* See Appendix, note [286]. [11] See Appendix, note [123].
[12] Known also as the *transverse scapular* or *transverse humeral vein.* [13] See Appendix, note [288]. [14] See Appendix, note [289].
[15] See Appendix, note [283]. [16] See Appendix, note [269]. [17] See Appendix, note [285].

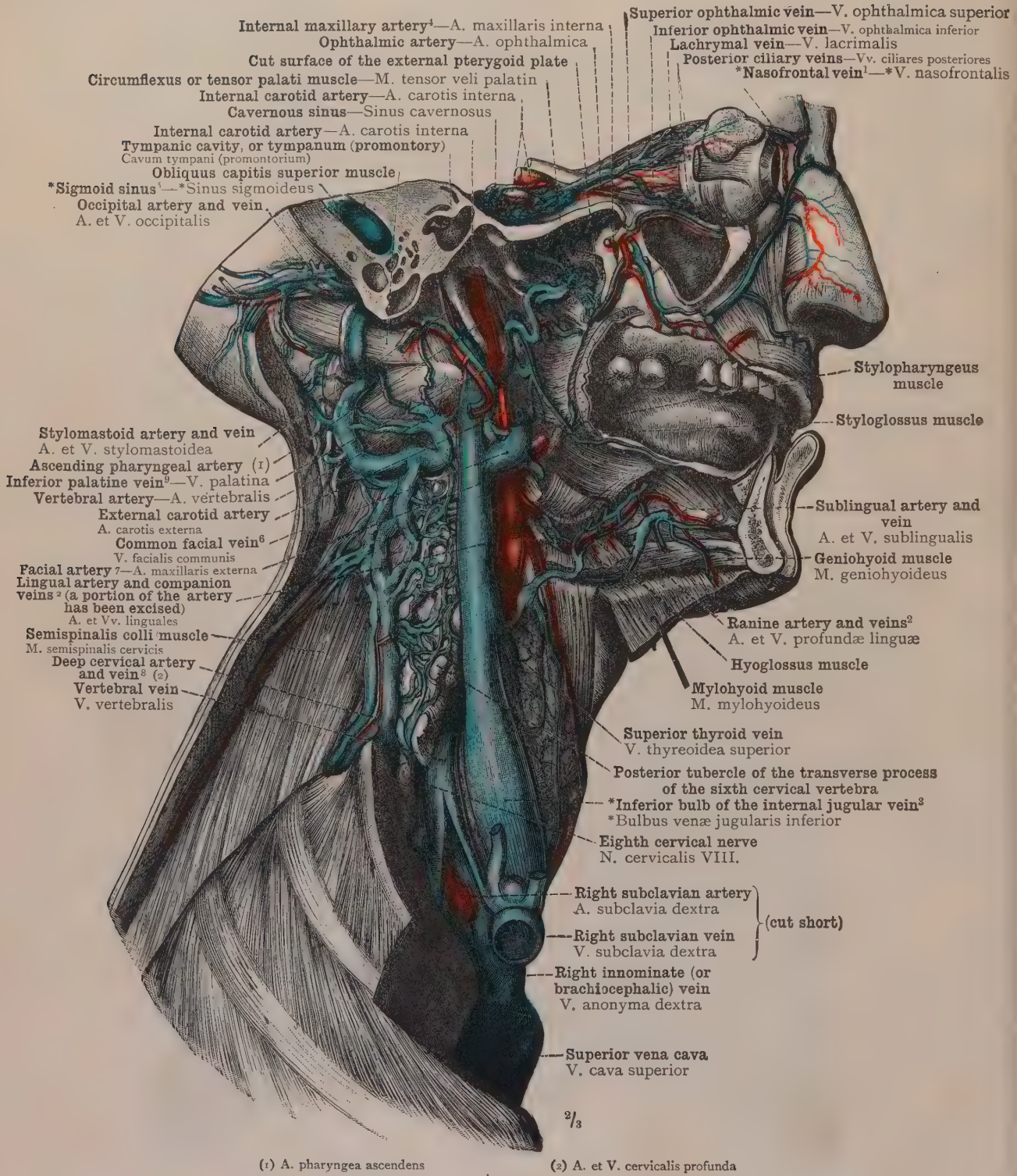
Veins of the Head, the Neck, and the Axilla.



[1] See Appendix, note [290]. [2] See Appendix, note [291].
[3] Or *ninth, tenth,* and *eleventh cranial nerves* in Soemmering's enumeration; together forming the *eighth cranial nerve* in Willis's enumeration.
[4] The **sigmoid sinus* is the proximal portion of the *lateral sinus* as described by most English anatomists. See Appendix, note [264].
[5] See Appendix, note [11]. [6] Companion to the *thyroidea ima artery.* See note [1] to p. 590.
[7] Known also as the *right* or *large azygos vein.* [8] Or *fifth cranial nerve.*
[9] Sometimes called the *posterior facial* vein. See Appendix, note [283]. [10] See Appendix, note [169].
[11] Known also as the *transverse scapular* or *transverse humeral vein.* [12] Known also as the *left upper azygos vein.*
[13] Known also as the *left lower* or *small azygos vein.*

FIG. 1080.—THE VEINS OF THE PHARYNX, THE ŒSOPHAGUS, AND THE TRACHEA; THE BASILAR VENOUS PLEXUS OR BASILAR SINUS (*see Appendix, note* [290]), PLEXUS BASILARIS; THE AZYGOS, HEMIAZYGOS, AND ACCESSORY HEMIAZYGOS VEINS (*see notes* [7], [12], *and* [13] *above*); THE THORACIC DUCT, DUCTUS THORACICUS. SEEN FROM BEHIND.

The Pharyngeal and Basilar Venous Plexuses.—The Azygos Veins.

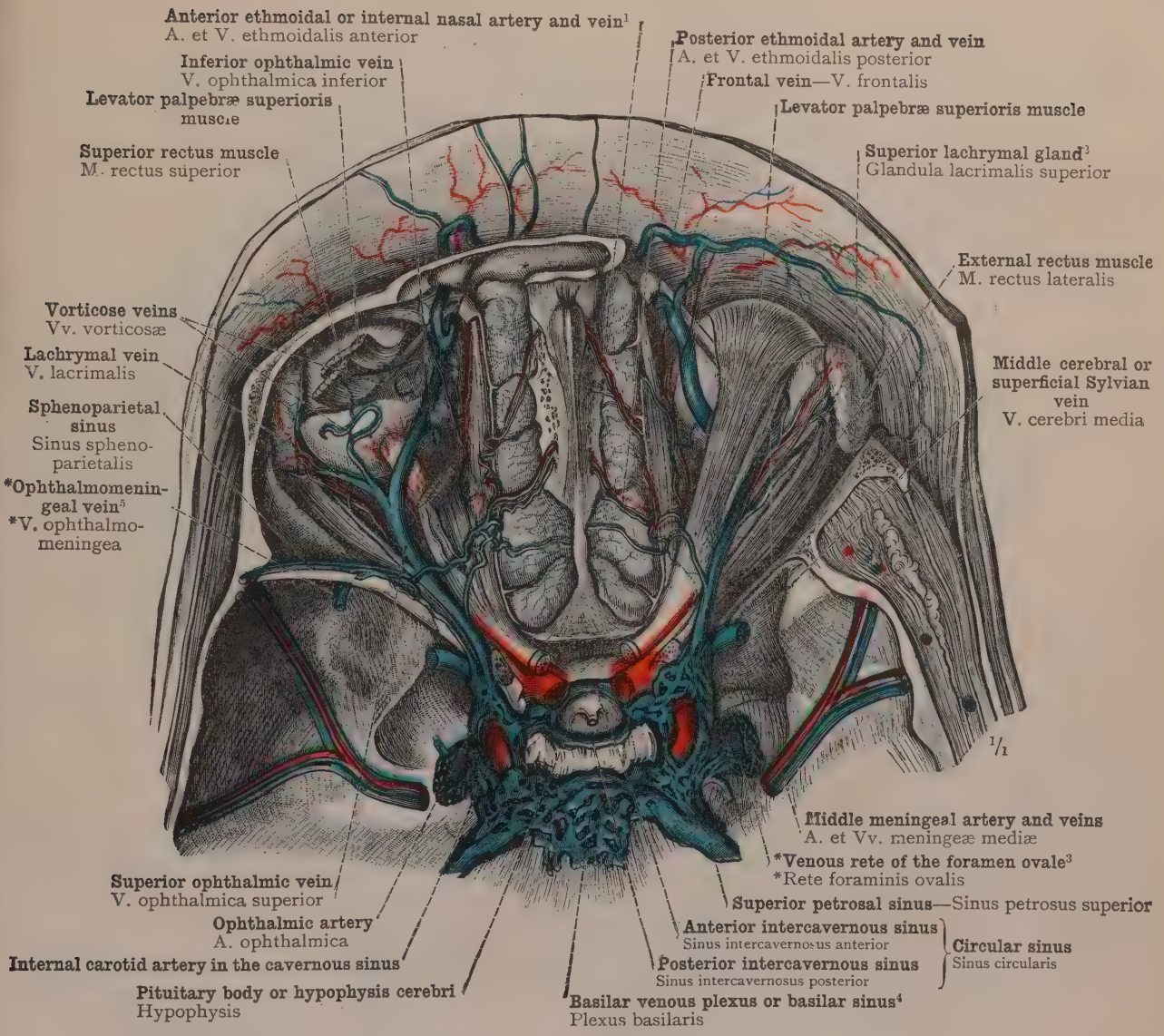


(1) A. pharyngea ascendens (2) A. et V. cervicalis profunda

1 See Appendix, note 282. 2 See Appendix, note 286. 3 See Appendix, note 121. 4 See Appendix, note 166.
5 The **sigmoid sinus* is the proximal portion of the *lateral sinus* as described by most English anatomists. See Appendix, note 264.
6 See Appendix, note 283. 7 See Appendix, note 166. 8 The *deep cervical vein* is known also as the *posterior vertebral vein.* 9 See note 7 to p. 689.

FIG. 1081.—THE CAVERNOUS SINUS AND THE VEINS OF THE ORBIT; THE DEEP VISCERAL VEINS OF THE HEAD AND NECK; THE DEEP CERVICAL OR POSTERIOR VERTEBRAL VEIN, VENA CERVICALIS PROFUNDA, AND THE VERTEBRAL VEIN, VENA VERTEBRALIS. SEEN FROM THE RIGHT SIDE.

The Deep Veins of the Head and Neck.

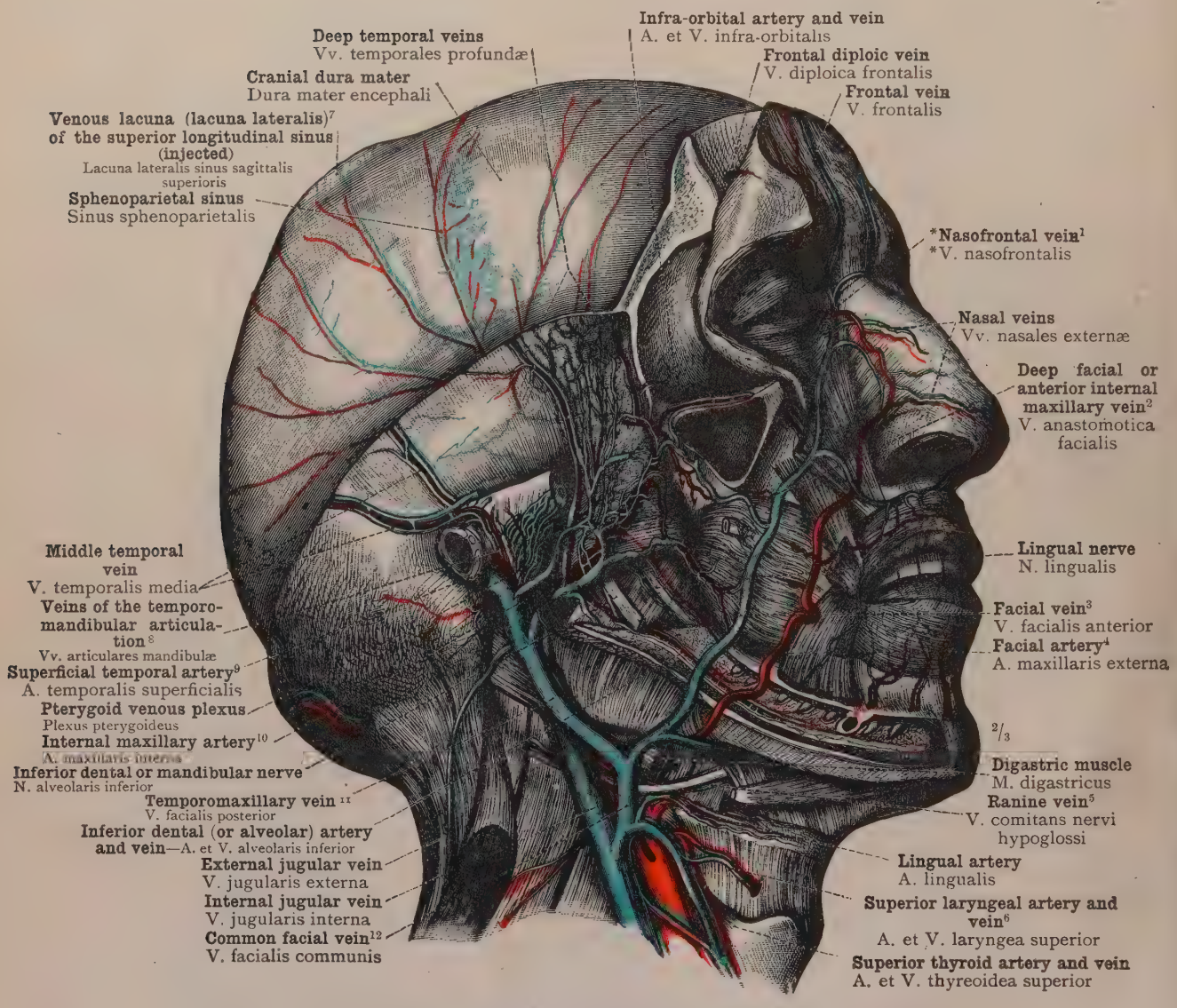


[1] See Appendix, note 184. [2] See Appendix, note 179. [3] See Appendix, note 292.
[4] Sometimes also known as the *transverse sinus*. See Appendix, note 290.
[5] A communicating branch between the *superior ophthalmic vein* and the *middle cerebral* or *superficial Sylvian vein*, which in this specimen, however, opens posteriorly into the *sphenoparietal sinus*.

FIG. 1082.—THE VEINS OF THE ORBIT, SEEN FROM ABOVE: THE SUPERIOR OPHTHALMIC VEIN, VENA OPHTHALMICA SUPERIOR, ITS CONFLUENCE WITH THE INFERIOR OPHTHALMIC VEIN, VENA OPHTHALMICA INFERIOR, AND ITS TERMINATION IN THE CAVERNOUS SINUS, SINUS CAVERNOSUS; THE LACHRYMAL VEIN, VENA LACRIMALIS; THE VORTICOSE VEINS, VENÆ VORTICOSÆ; MUSCULAR VEINS, VENÆ MUSCULARES; THE *OPHTHALMOMENINGEAL VEIN, *VENA OPHTHALMOMENINGEA, OPENING POSTERIORLY, IN THIS SPECIMEN, INTO THE SPHENOPARIETAL SINUS, SINUS SPHENOPARIETALIS. THE CAVERNOUS SINUS, SINUS CAVERNOSUS, AND THE ANTERIOR AND POSTERIOR INTERCAVERNOUS SINUSES, SINUS CAVERNOSI ANTERIOR ET POSTERIOR, THE RIGHT AND LEFT CAVERNOUS SINUSES AND THE ANTERIOR AND POSTERIOR INTERCAVERNOUS SINUSES, COMBINING TO MAKE UP THE CIRCULAR SINUS, SINUS CIRCULARIS. THE BASILAR VENOUS PLEXUS OR BASILAR SINUS (*see note* [4] *above*), PLEXUS BASILARIS. THE MIDDLE MENINGEAL ARTERY AND VEINS, ARTERIA ET VENÆ MENINGEÆ MEDIÆ.

The left orbit was opened, by the removal of its roof, the right by the removal of its roof and the greater part of its outer wall. On the right side, the muscles of the orbit were left intact; on the left side, the levator palpebræ superioris and superior rectus muscle were partly removed, in order to lay bare the superior ophthalmic vein throughout its whole course. On the left side, in the dura mater covering the inferior surface of the small wing of the sphenoid bone (this wing having first been removed), the sphenoparietal sinus was exposed, and was traced to its termination in the cavernous sinus.

The Veins of the Orbit.—The Cavernous and Circular Sinuses.

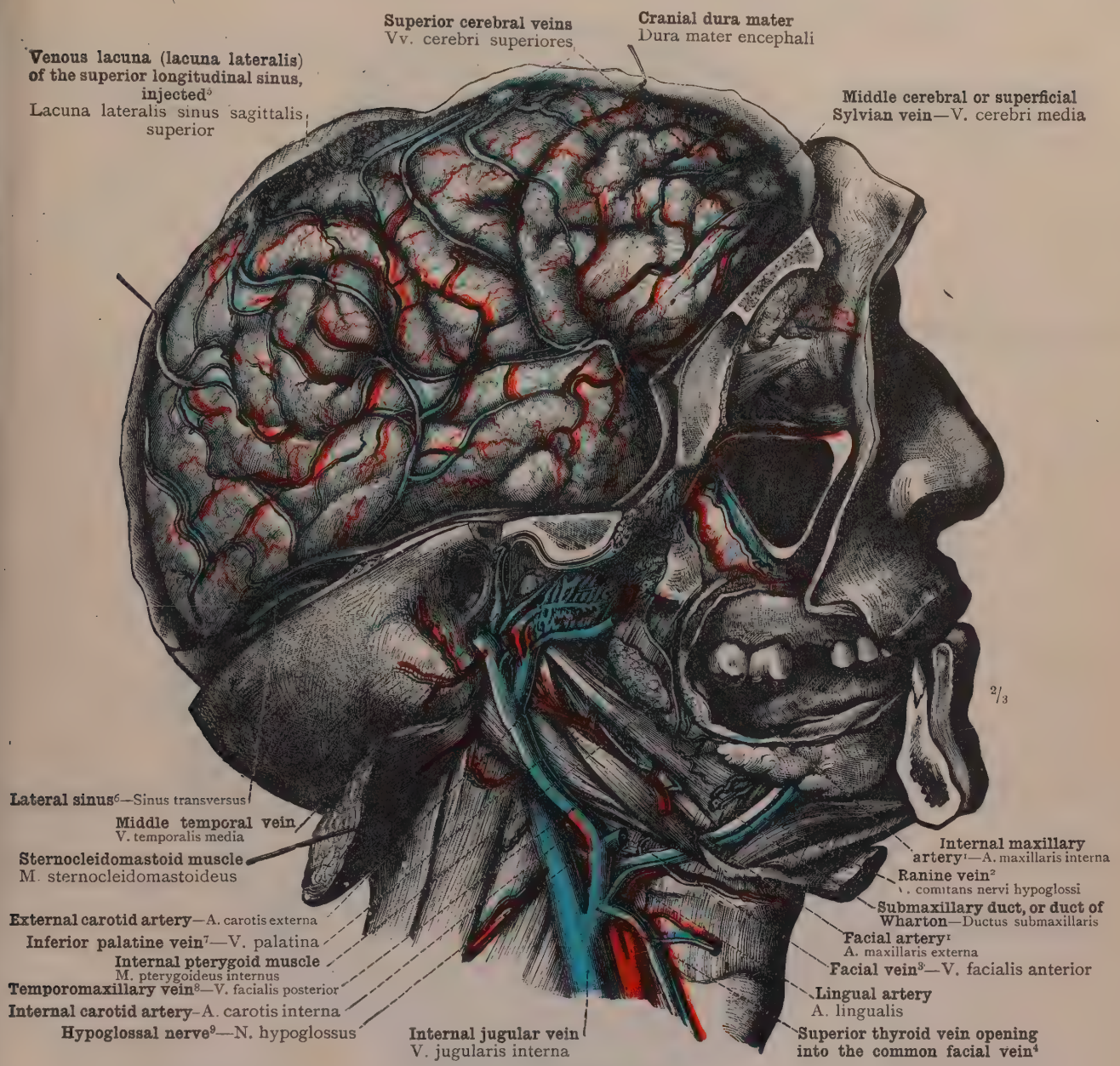


1 See Appendix, note 282. 2 This vein is a communicating branch from the *pterygoid venous plexus*.
3 Sometimes distinguished as the *anterior facial vein*. See Appendix, note 283. 4 See Appendix, note 166. 5 See Appendix, note 286.
6 Or *laryngeal branch* of the *superior thyroid artery* and *vein*, respectively.
7 See Appendix, note 293. 8 See Appendix, note 287. 9 See Appendix, note 168. 10 See Appendix, note 166.
11 Sometimes called the *posterior facial vein*. See Appendix, note 283. 12 See Appendix, note 283.

FIG. 1083.—THE FORMATION OF THE COMMON FACIAL VEIN, VENA FACIALIS COMMUNIS, BY THE CONFLUENCE OF THE FACIAL (OR ANTERIOR FACIAL) VEIN, VENA FACIALIS ANTERIOR, AND THE TEMPOROMAXILLARY (OR POSTERIOR FACIAL) VEIN, VENA FACIALIS POSTERIOR (*see Appendix, note* 283). THE PTERYGOID VENOUS PLEXUS, PLEXUS PTERYGOIDEUS, THE VEINS OF THE LOWER JAW, AND THE VEINS OF THE DURA MATER—THE MIDDLE MENINGEAL VEINS, VENÆ MENINGEÆ MEDIÆ. SEEN FROM THE RIGHT SIDE.

By the partial removal of the skull-cap (calvaria), the cranial dura mater was exposed. By the removal of the zygomatic arch, of the upper half of the ramus of the mandible (with the exception of the head of the condyle), and of the temporal and masseter muscles, the pterygoid venous plexus, plexus pterygoideus, was exposed. By the opening of the mandibular or inferior dental canal, canalis mandibulæ, the inferior dental (or alveolar) artery and its plexiform companion veins were exposed.

The Pterygoid Venous Plexus, Plexus Pterygoideus.—The Veins of the Dura Mater and of the Lower Jaw.

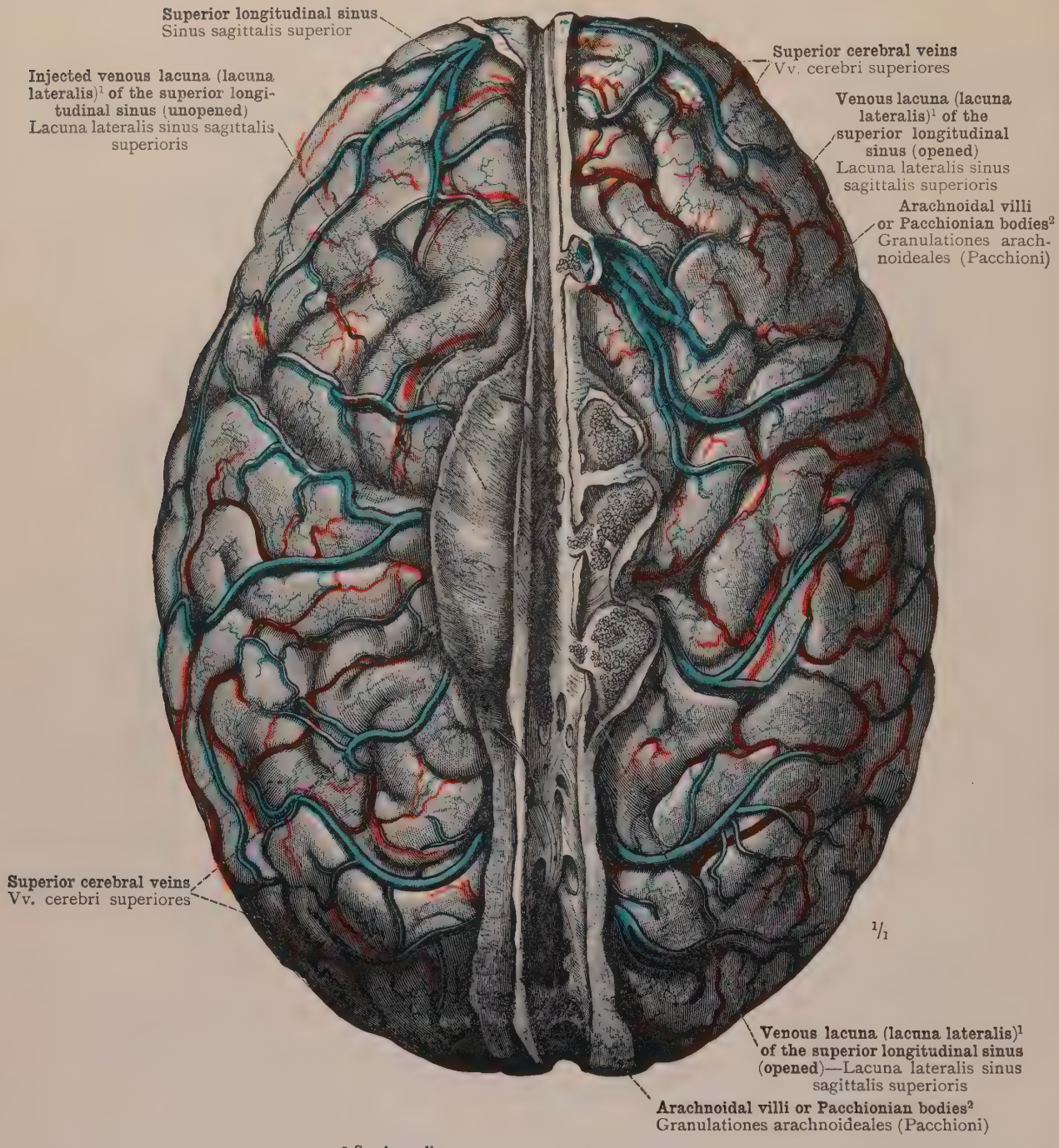


1 See Appendix, note 166. 2 See Appendix, note 286. 3 Sometimes distinguished as the *anterior facial vein*. See Appendix, note 283.
4 See Appendix, note 294. 5 See Appendix, note 293. 6 See Appendix, note 264. 7 See Appendix, note 295.
8 Sometimes called the *posterior facial vein*. See Appendix, note 283.
9 Or *twelfth cranial nerve*, in Soemmerring's enumeration; *ninth cranial nerve*, in that of Willis. Sometimes also called the *lingual motor nerve*.

FIG. 1084.—THE VEINS OF THE CONVEXITY OF THE CEREBRAL HEMISPHERES, SUPERIOR CEREBRAL VEINS, VENÆ CEREBRI SUPERIORES, AND THEIR TERMINATION IN THE SUPERIOR LONGITUDINAL SINUS; THE MIDDLE CEREBRAL OR SUPERFICIAL SYLVIAN VEIN, VENA CEREBRI MEDIA. IN THIS SPECIMEN, THE INTERNAL MAXILLARY ARTERY RUNS ON THE OUTER INSTEAD OF ON THE INNER SURFACE OF THE EXTERNAL PTERYGOID MUSCLE, SURROUNDED BY THE DEEPER PORTION OF THE PTERYGOID VENOUS PLEXUS, PLEXUS PTERYGOIDEUS, AND THIS LATTER, ON ACCOUNT OF THE ABNORMAL COURSE OF THE ARTERY, IS MORE LARGELY DEVELOPED THAN USUAL. SEEN FROM THE RIGHT SIDE.

The skull-cap (calvaria) and the cranial dura mater having been completely removed, the veins on the convexity of the right cerebral hemisphere were exposed, and were traced to their termination in the venous lacunæ (lacunæ laterales) of the superior longitudinal sinus (*see Appendix, note* 293). The right half of the mandible was removed, the interarticular disc being, however, left behind. A portion of the upper head only of the external pterygoid muscle was preserved, as also was the cranial extremity of the internal pterygoid muscle.

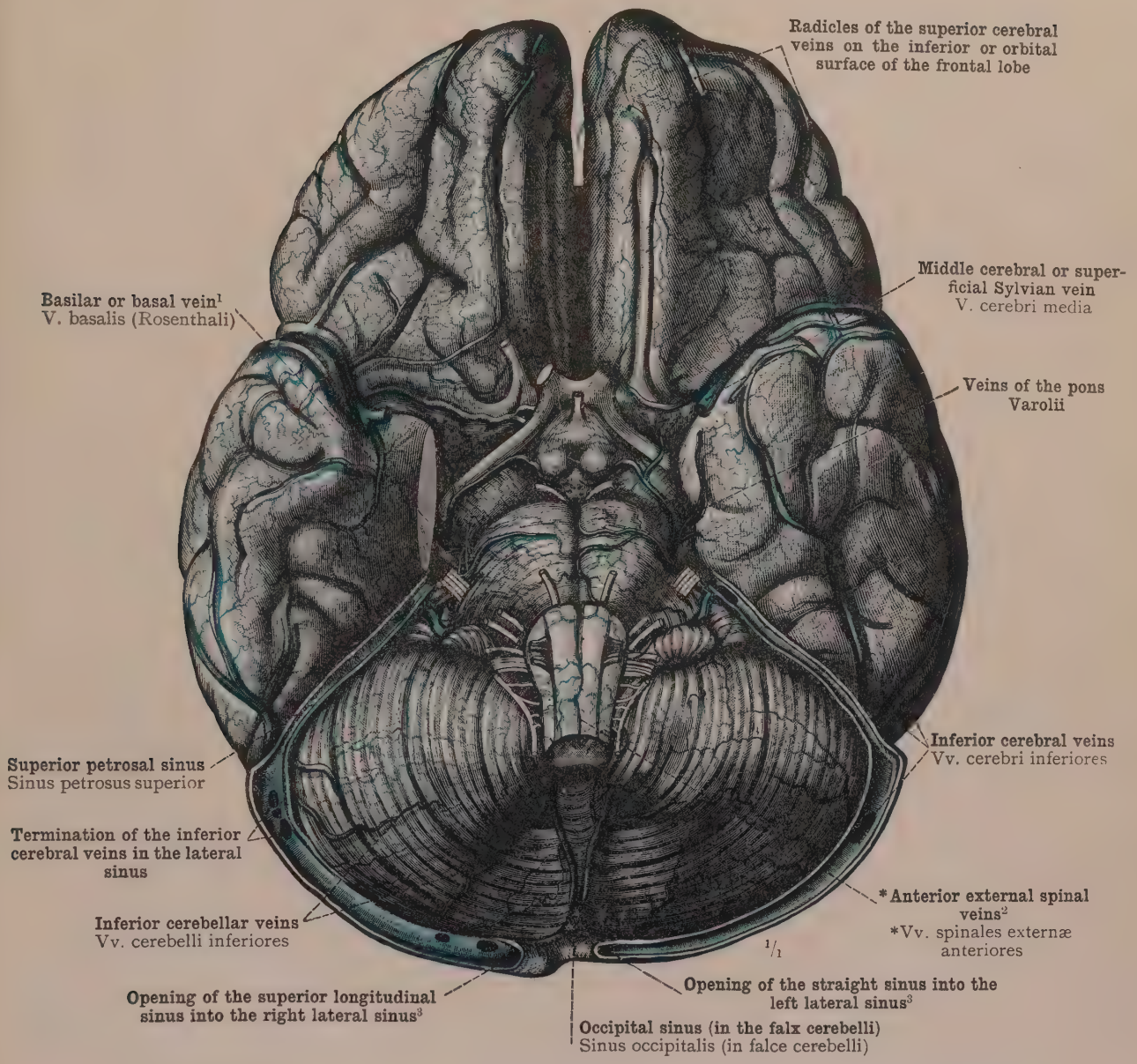
The Pterygoid Venous Plexus, Plexus Pterygoideus.—The Veins of the Brain.


Superior longitudinal sinus
Sinus sagittalis superior
Injected venous lacuna (lacuna lateralis)[1] of the superior longitudinal sinus (unopened)
Lacuna lateralis sinus sagittalis superioris
Superior cerebral veins
Vv. cerebri superiores
Venous lacuna (lacuna lateralis)[1] of the superior longitudinal sinus (opened)
Lacuna lateralis sinus sagittalis superioris
Arachnoidal villi or Pacchionian bodies[2]
Granulationes arachnoideales (Pacchioni)
Superior cerebral veins
Vv. cerebri superiores
1/1
Venous lacuna (lacuna lateralis)[1] of the superior longitudinal sinus (opened)—Lacuna lateralis sinus sagittalis superioris
Arachnoidal villi or Pacchionian bodies[2]
Granulationes arachnoideales (Pacchioni)

[1] See Appendix, note 293. [2] See Appendix, note 296.

FIG. 1085.—THE SUPERIOR CEREBRAL VEINS, VENÆ CEREBRI SUPERIORES. THE SUPERIOR LONGITUDINAL SINUS, SINUS SAGITTALIS SUPERIOR; ITS VENOUS LACUNÆ (LACUNÆ LATERALES—*see Appendix, note* [293]), AND THE RELATIONS OF THE LATTER TO THE SUPERIOR CEREBRAL VEINS AND TO THE ARACHNOIDAL VILLI OR PACCHIONIAN BODIES (GRANULATIONES ARACHNOIDEALES PACCHIONI—*see Appendix, note* [296]). SEEN FROM ABOVE.

The cranial dura mater was removed, except in the immediate vicinity of the superior longitudinal sinus (sinus sagittalis superior), which was opened. On the left side the injected venous lacunæ (lacunæ laterales) of this sinus are seen unopened; on the right side these lacunæ were opened from above, and the arachnoidal villi or Pacchionian bodies proliferating in their interior were thus displayed.


Radicles of the superior cerebral veins on the inferior or orbital surface of the frontal lobe
Middle cerebral or superficial Sylvian vein
V. cerebri media
Basilar or basal vein[1]
V. basalis (Rosenthali)
Veins of the pons Varolii
Inferior cerebral veins
Vv. cerebri inferiores
Superior petrosal sinus
Sinus petrosus superior
Termination of the inferior cerebral veins in the lateral sinus
*Anterior external spinal veins[2]
*Vv. spinales externæ anteriores
Inferior cerebellar veins
Vv. cerebelli inferiores
1/1
Opening of the straight sinus into the left lateral sinus[3]
Opening of the superior longitudinal sinus into the right lateral sinus[3]
Occipital sinus (in the falx cerebelli)
Sinus occipitalis (in falce cerebelli)

[1] See Appendix, note [297].

[2] See Appendix, note [298].

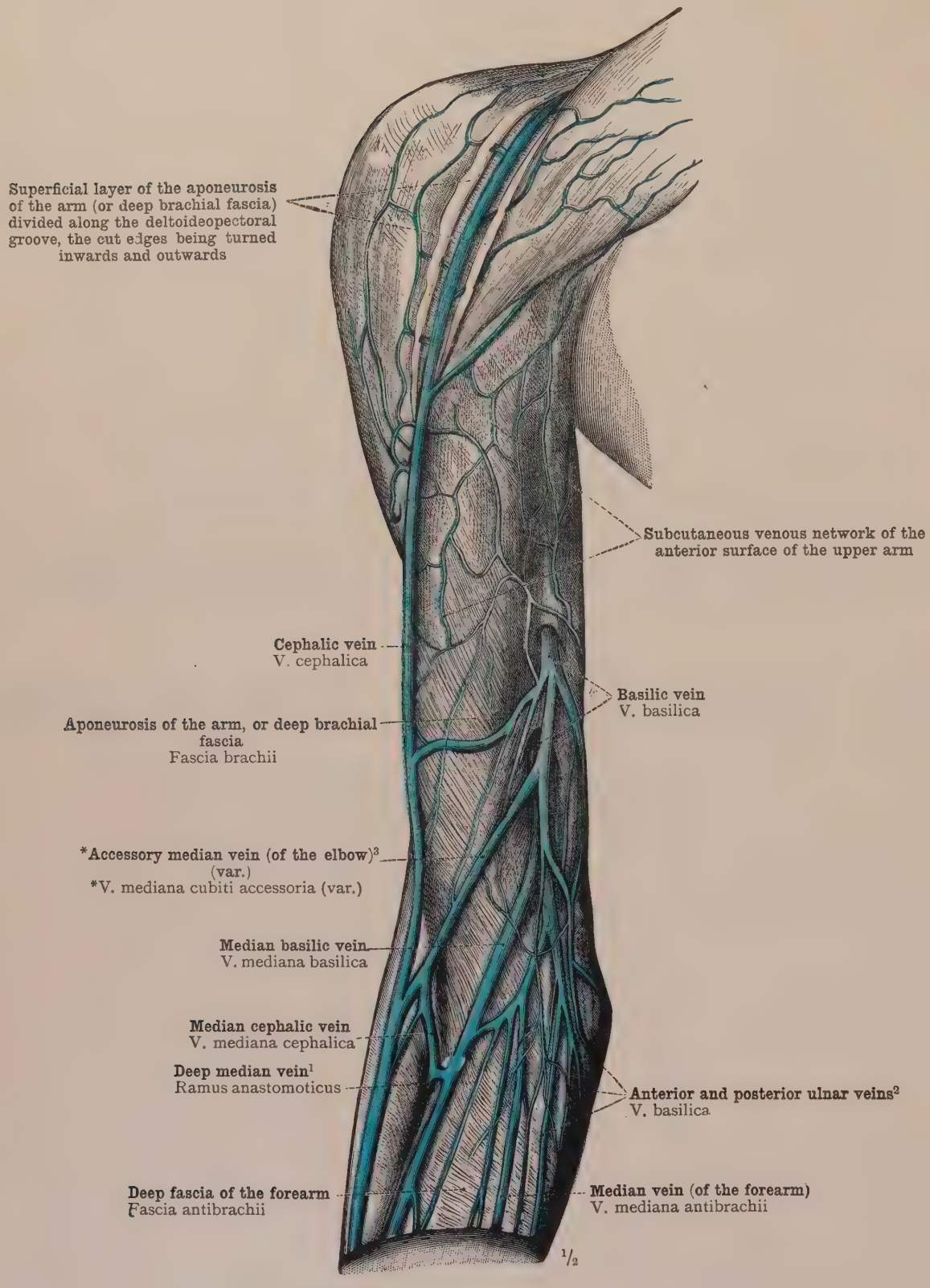
[3] See Appendix, notes [264] and [266].

FIG. 1086.—THE VEINS OF THE BASE OF THE BRAIN: THE MIDDLE CEREBRAL OR SUPERFICIAL SYLVIAN VEIN, VENA CEREBRI MEDIA; THE INFERIOR CEREBRAL VEINS, VENÆ CEREBRI INFERIORES; THE RADICLES AND THE TRUNK OF THE BASILAR OR BASAL VEIN, VENA BASALIS ROSENTHALI (*see Appendix, note* [297]); THE VEINS OF THE PONS VAROLII, AND THE INFERIOR CEREBELLAR VEINS, VENÆ CEREBELLI INFERIORES.

The brain was removed from the cranial cavity, together with the tentorium cerebelli, so that along the attached borders of the tentorium the lateral sinuses and the inferior petrosal sinuses were opened from below. The frontal lobes were drawn a little apart, in order to display the veins on their internal or mesial surfaces. The right temporal lobe was drawn away from the cerebral peduncle, and a sufficient portion of this lobe was removed to expose the trunk of the basilar or basal vein (vena basalis Rosenthali).

VENÆ EXTREMITATUM SUPERIORUM ET INFERIORUM

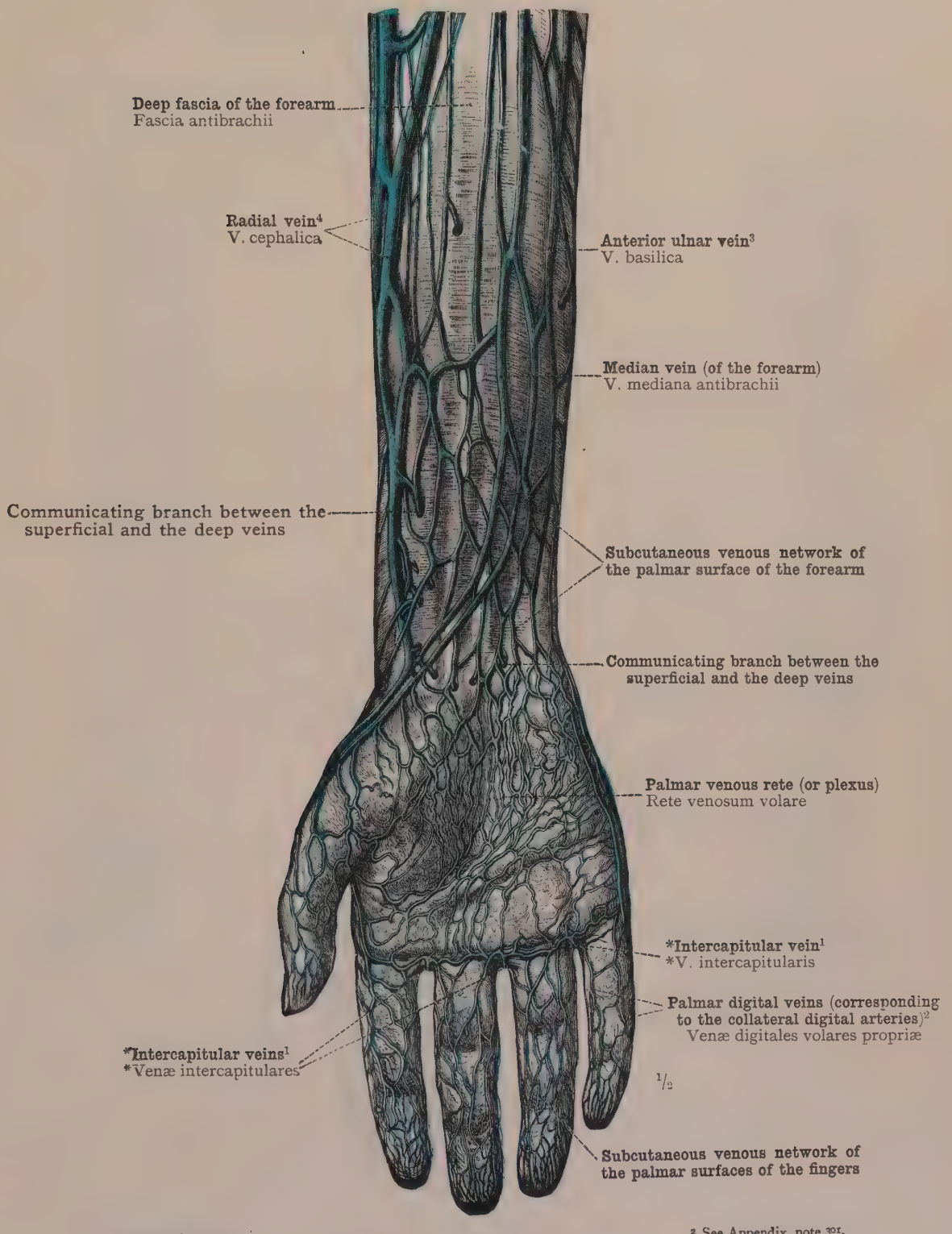
THE VEINS OF THE UPPER AND LOWER LIMBS


Superficial layer of the aponeurosis of the arm (or deep brachial fascia) divided along the deltoideopectoral groove, the cut edges being turned inwards and outwards
Subcutaneous venous network of the anterior surface of the upper arm
Cephalic vein
V. cephalica
Basilic vein
V. basilica
Aponeurosis of the arm, or deep brachial fascia
Fascia brachii
*Accessory median vein (of the elbow)[3] (var.)
*V. mediana cubiti accessoria (var.)
Median basilic vein
V. mediana basilica
Median cephalic vein
V. mediana cephalica
Deep median vein[1]
Ramus anastomoticus
Anterior and posterior ulnar veins[2]
V. basilica
Deep fascia of the forearm
Fascia antibrachii
Median vein (of the forearm)
V. mediana antibrachii
1/2

1 See Appendix, note 299.
2 Called by Macalister *anterior* and *posterior superficial ulnar veins.* See Appendix, note 306.
3 See Appendix, note 308.

FIG. 1087.—THE SUBCUTANEOUS VEINS OF THE FRONT OF THE SHOULDER, THE FRONT OF THE ARM, AND THE FLEXURE OF THE ELBOW.

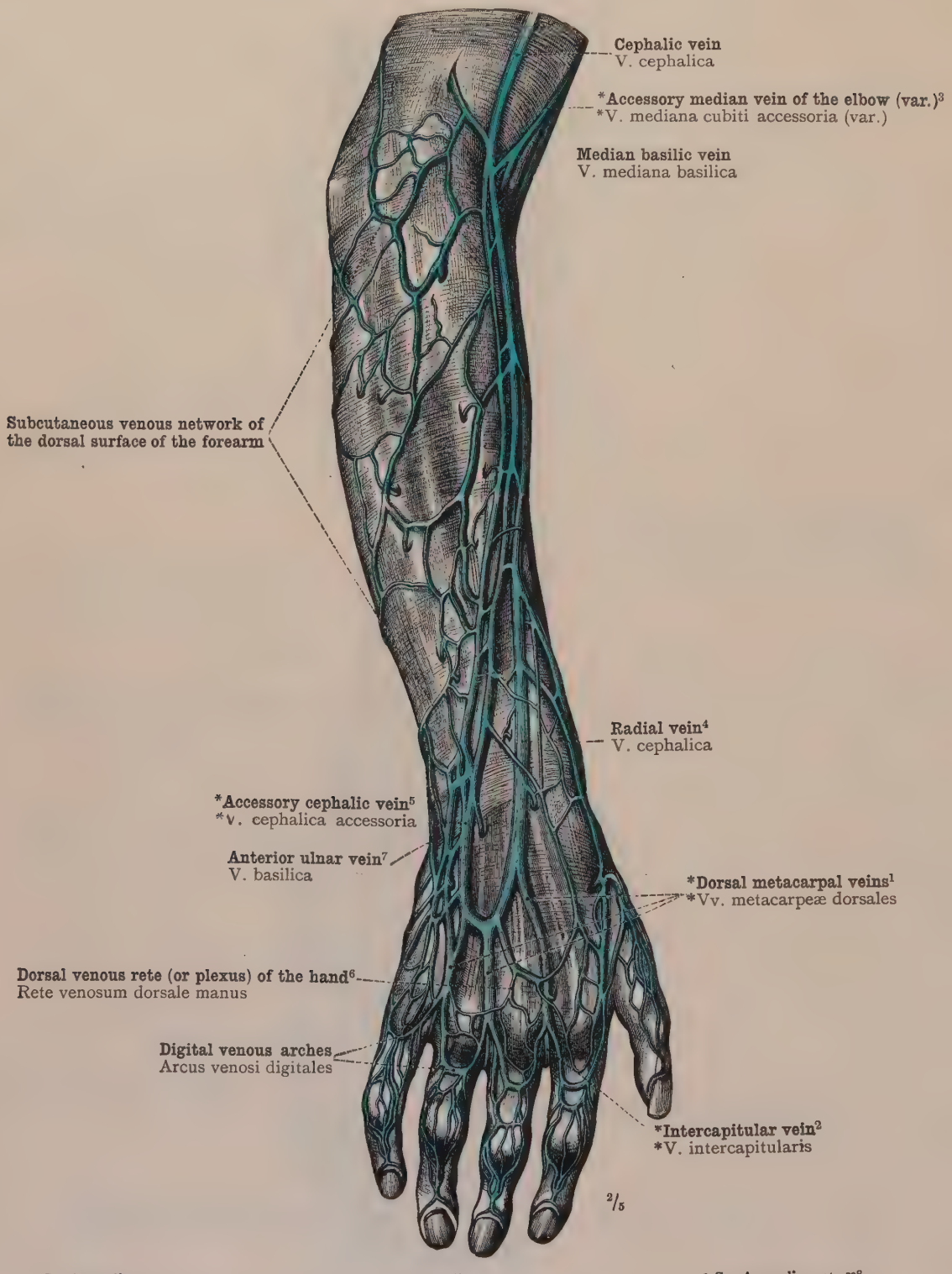
Cutaneous Veins of the Arm.


Deep fascia of the forearm
Fascia antibrachii
Radial vein[4]
V. cephalica
Anterior ulnar vein[3]
V. basilica
Median vein (of the forearm)
V. mediana antibrachii
Communicating branch between the superficial and the deep veins
Subcutaneous venous network of the palmar surface of the forearm
Communicating branch between the superficial and the deep veins
Palmar venous rete (or plexus)
Rete venosum volare
*Intercapitular vein[1]
*V. intercapitularis
Palmar digital veins (corresponding to the collateral digital arteries)[2]
Venæ digitales volares propriæ
*Intercapitular veins[1]
*Venæ intercapitulares
1/2
Subcutaneous venous network of the palmar surfaces of the fingers

[1] See Appendix, note 300.
[3] Called by Macalister the *anterior superficial ulnar vein*. See Appendix, note 306.
[2] See Appendix, note 301.
[4] See Appendix, note 305.

FIG. 1088.—THE SUBCUTANEOUS VEINS OF THE PALMAR SURFACE OF THE FOREARM AND HAND.

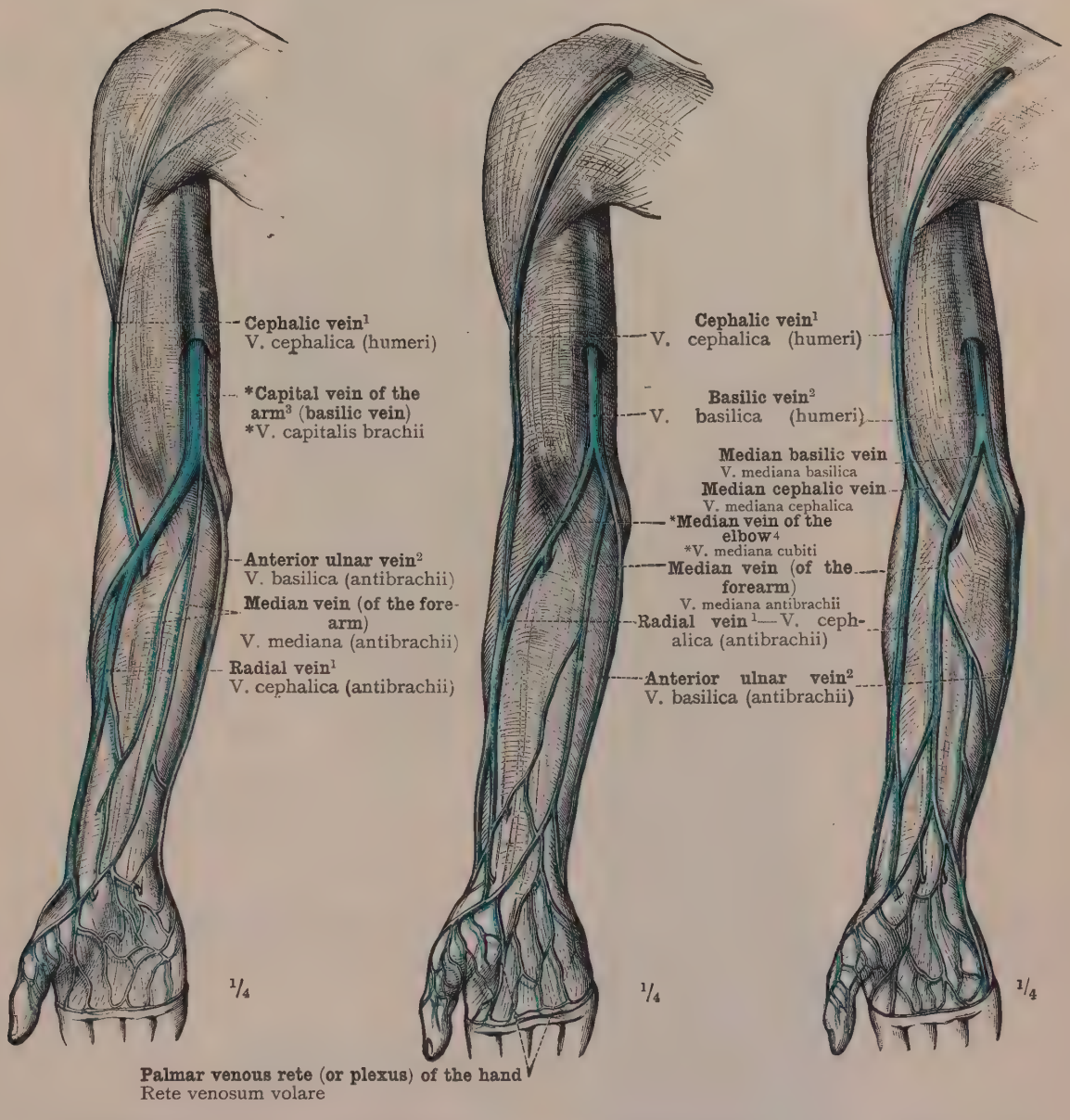
Cutaneous Veins of the Arm.



1 See Appendix, note 302. 2 See Appendix, note 300. 3 See Appendix, note 308.
4 See Appendix, note 305. 5 See Appendix, note 303. 6 See Appendix, note 304.
7 Called by Macalister the *anterior superficial ulnar vein.* See Appendix, note 306.

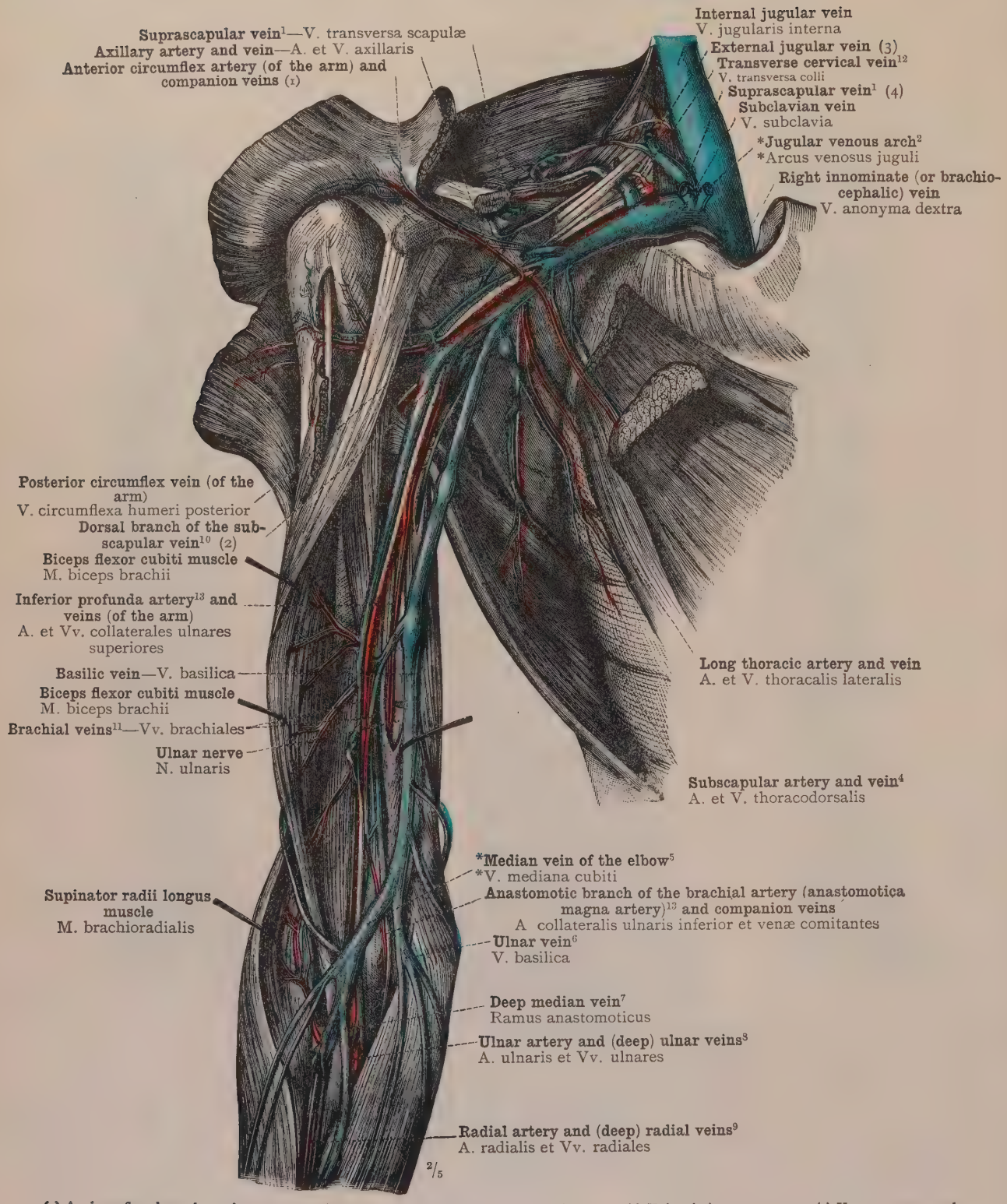
FIG. 1089.—THE SUBCUTANEOUS VEINS OF THE DORSAL SURFACE OF THE FOREARM AND HAND.

Cutaneous Veins of the Arm.



[1] See Appendix, note [205]. [2] See Appendix, note [305]. [3] See Appendix, note [307]. [4] See Appendix, note [308].

FIG. 1090.—THE COMMONER VARIETIES OF THE SUBCUTANEOUS VEINS OF THE ARM (*see Appendix, notes* [307] *and* [308]). THE *CAPITAL VEIN OF THE ARM, *VENA CAPITALIS BRACHII (*K. von Bardeleben*), AND ITS COLLATERAL CHANNELS.

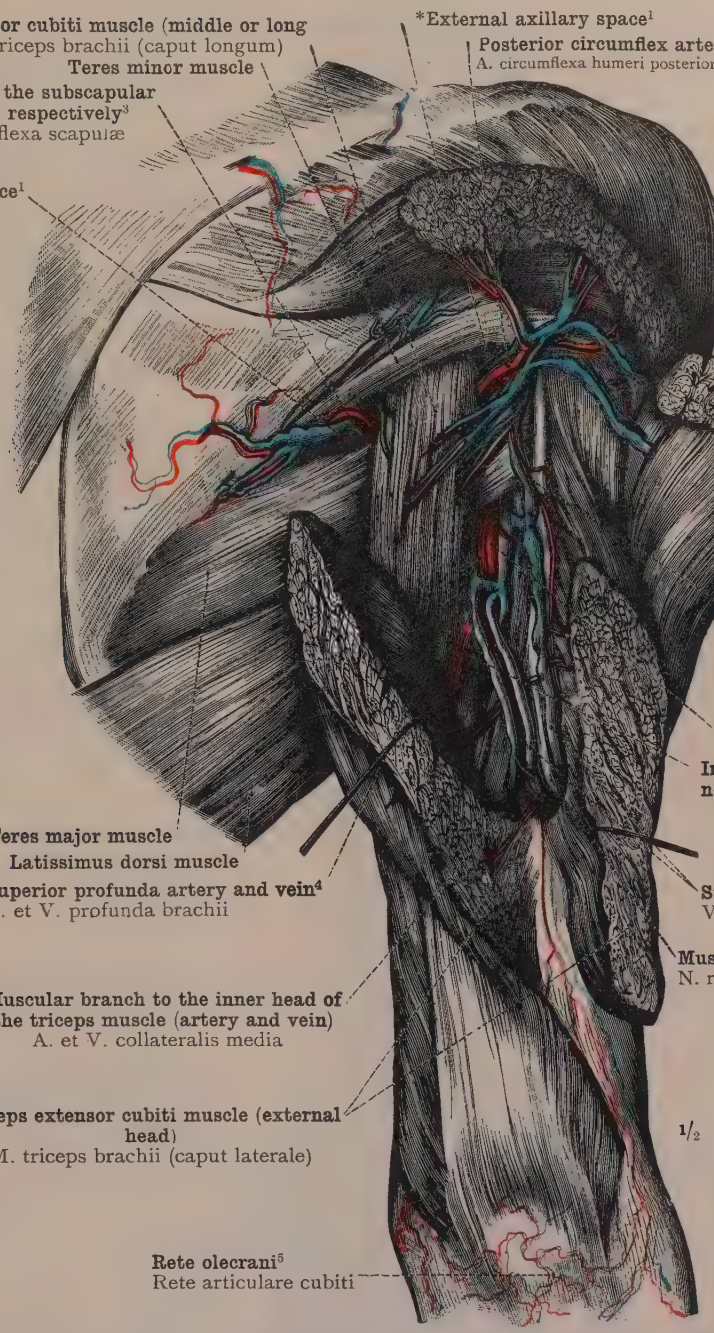

Suprascapular vein[1]—V. transversa scapulæ
Axillary artery and vein—A. et V. axillaris
Anterior circumflex artery (of the arm) and companion veins (1)
Internal jugular vein
V. jugularis interna
External jugular vein (3)
Transverse cervical vein[12]
V. transversa colli
Suprascapular vein[1] (4)
Subclavian vein
V. subclavia
*Jugular venous arch[2]
*Arcus venosus juguli
Right innominate (or brachiocephalic) vein
V. anonyma dextra
Posterior circumflex vein (of the arm)
V. circumflexa humeri posterior
Dorsal branch of the subscapular vein[10] (2)
Biceps flexor cubiti muscle
M. biceps brachii
Inferior profunda artery[13] and veins (of the arm)
A. et Vv. collaterales ulnares superiores
Basilic vein—V. basilica
Biceps flexor cubiti muscle
M. biceps brachii
Brachial veins[11]—Vv. brachiales
Ulnar nerve
N. ulnaris
Long thoracic artery and vein
A. et V. thoracalis lateralis
Subscapular artery and vein[4]
A. et V. thoracodorsalis
*Median vein of the elbow[5]
*V. mediana cubiti
Anastomotic branch of the brachial artery (anastomotica magna artery)[13] and companion veins
A collateralis ulnaris inferior et venæ comitantes
Supinator radii longus muscle
M. brachioradialis
Ulnar vein[6]
V. basilica
Deep median vein[7]
Ramus anastomoticus
Ulnar artery and (deep) ulnar veins[8]
A. ulnaris et Vv. ulnares
Radial artery and (deep) radial veins[9]
A. radialis et Vv. radiales
2/5

(1) A. circumflexa humeri anterior et venæ comitantes (2) V. circumflexa scapulæ (3) V. jugularis externa (4) V. transversa scapulæ

1 Known also as the *transverse scapular* or *transverse humeral vein.*
2 See Appendix, note 123.
3 Known also as the *external mammary artery* and *vein.*
4 See Appendix, note 309.
5 See Appendix, note 308.
6 See Appendix, note 310.
7 See Appendix, note 311.
8 Or *venæ comites of the ulnar artery.*
9 Or *venæ comites of the radial artery.*
10 Often called the *dorsalis scapulæ vein.*
11 Or *venæ comites of the brachial artery.*
12 See Appendix, note 262.
13 See Appendix, note 209.

FIG. 1091.—THE DEEP VEINS AND ARTERIES OF THE (*GREATER) SUPRACLAVICULAR FOSSA (*see Appendix, note* 289), *FOSSA SUPRACLAVICULARIS MAJOR, OF THE AXILLA, AND OF THE FRONT OF THE UPPER ARM; THE CONNEXION BETWEEN THE SUPERFICIAL AND THE DEEP VEINS OF THE FLEXURE OF THE ELBOW.

Deep Veins of the Axilla and the Upper Arm.


Triceps extensor cubiti muscle (middle or long head)—M. triceps brachii (caput longum)
Teres minor muscle
Dorsal branches of the subscapular artery and vein, respectively[3]
A. et V. circumflexa scapulæ
*Internal axillary space[1]
*External axillary space[1]
Posterior circumflex artery and veins (of the arm)
A. circumflexa humeri posterior et Vv. circumflexæ humeri posteriores
Deltoid muscle
M. deltoideus
Accessory superior profunda artery[4] arising from the posterior circumflex artery (var.)
A. collateralis radialis accessoria ex arteriâ circumflexâ humeri posteriore (var.)
Brachial artery and brachial veins[2]
A. brachialis et Vv. brachiales
Inferior profunda artery (arising abnormally from the superior profunda artery) and companion veins
A. collateralis ulnaris superior ex arteriâ profundâ brachiâ et venæ comitantes
Superior profunda veins
Vv. collaterales radiales
Musculospiral nerve
N. radialis
Teres major muscle
Latissimus dorsi muscle
Superior profunda artery and vein[4]
A. et V. profunda brachii
Muscular branch to the inner head of the triceps muscle (artery and vein)
A. et V. collateralis media
Triceps extensor cubiti muscle (external head)
M. triceps brachii (caput laterale)
1/2
Rete olecrani[5]
Rete articulare cubiti

1 **Internal and External Axillary Spaces.*—For an account of these, see note [1] to p. 312, in Part III. The **internal axillary space* is called by Macalister the *subscapular triangle*, and the **external axillary space* is called by Macalister the *quadrilateral space*.—Tr.

2 Or *venæ comites of the brachial artery*.

3 Known also as the *dorsalis scapulæ artery* and *vein*, respectively.

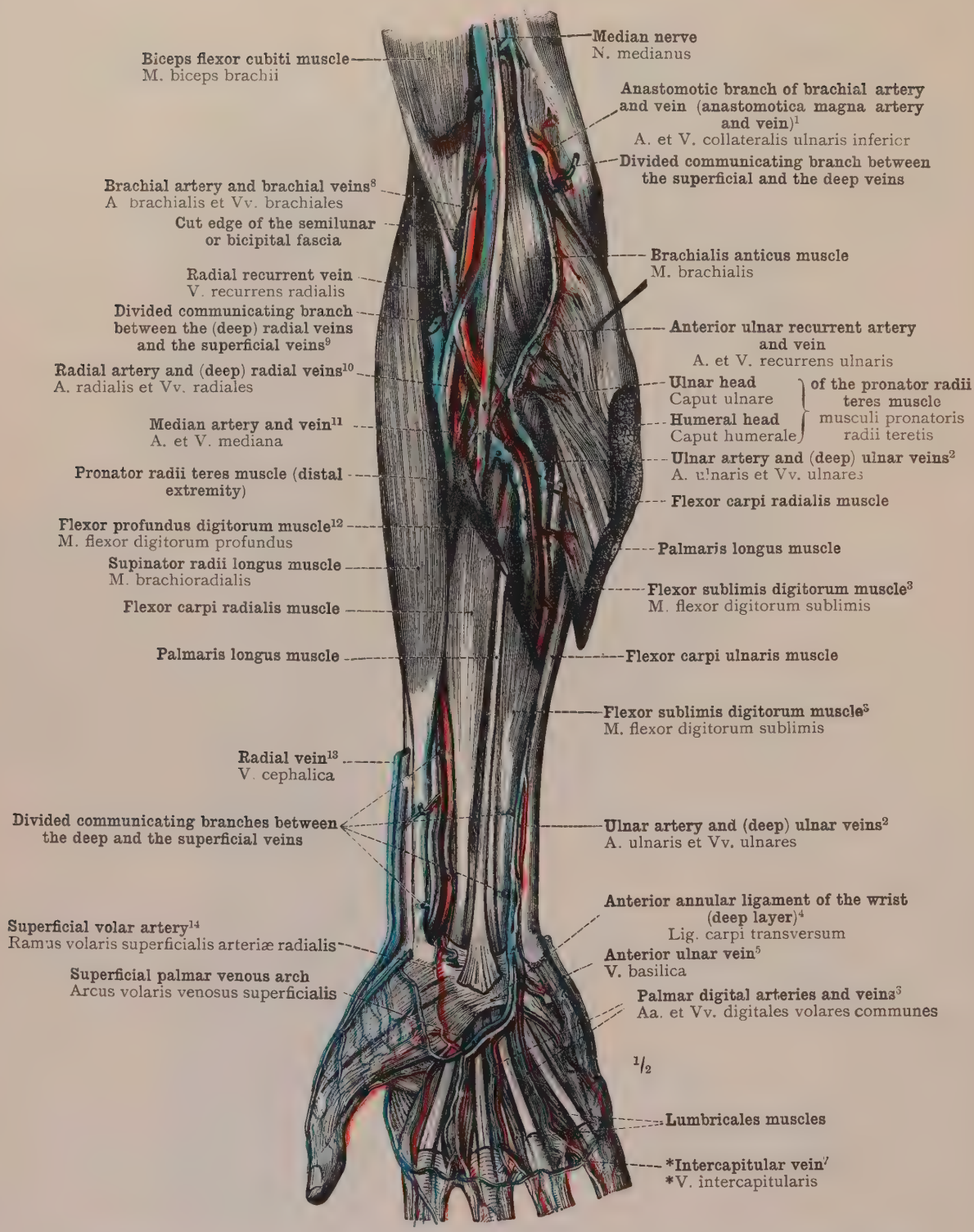
4 See Appendix, note 209.

5 See Appendix, note 212.

FIG. 1092.—THE DEEP VEINS AND ARTERIES OF THE DORSAL SURFACE OF THE RIGHT SHOULDER AND UPPER ARM; SEEN FROM BEHIND.

A horizontal incision was made through the hinder part of the deltoid muscle somewhat above the middle of its vertical extent, the margins of the incision were turned upwards and downwards, and the teres minor muscle was drawn a little upwards, in order to expose the vessels passing through the *axillary spaces (*see note [1] above*). The external head of the triceps extensor cubiti muscle was divided by a longitudinal incision, and the segments were drawn apart, in order to expose the ramification of the superior profunda vessels.

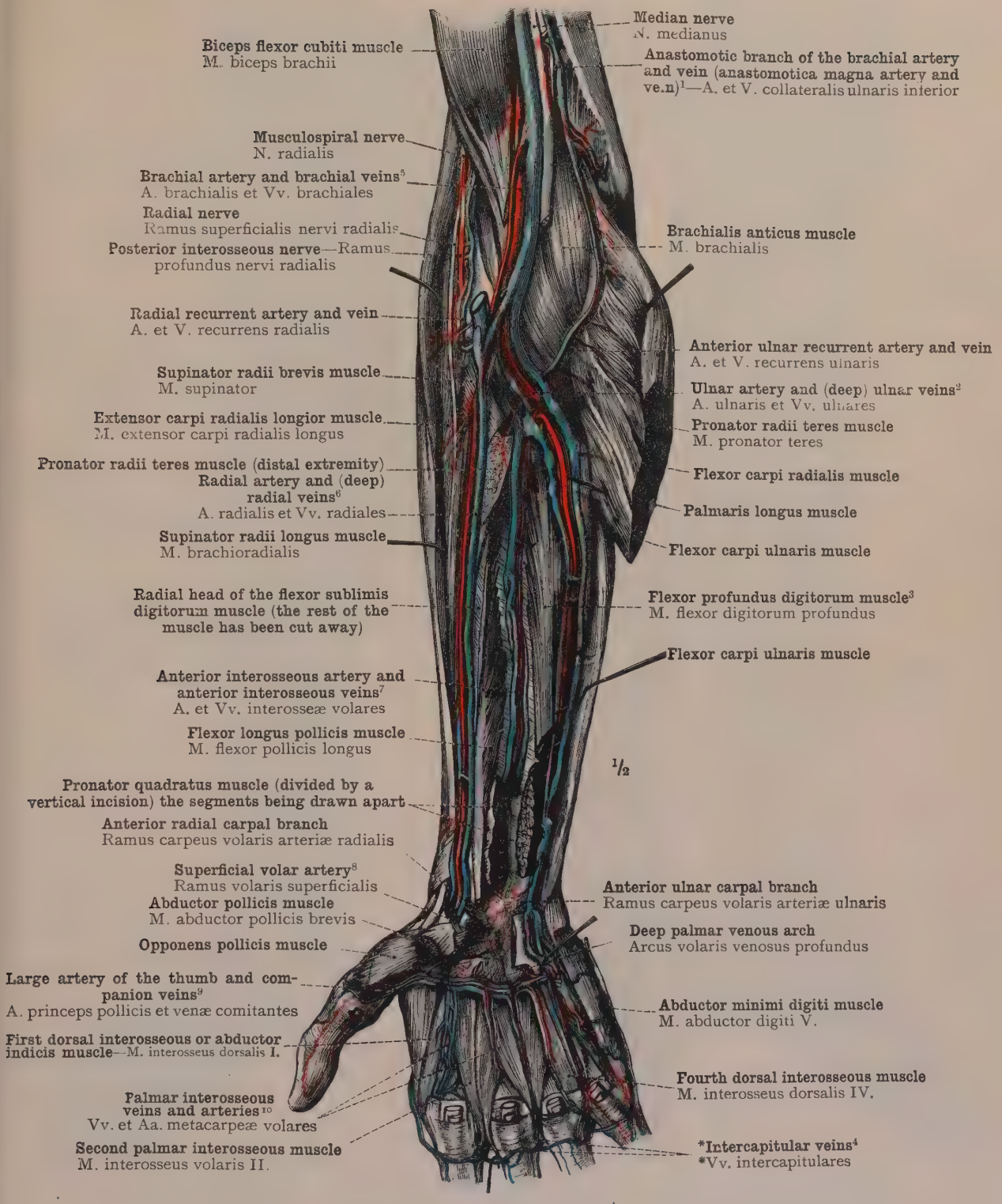
Deep Veins of the Shoulder and the Upper Arm.


Biceps flexor cubiti muscle
M. biceps brachii
Brachial artery and brachial veins[8]
A. brachialis et Vv. brachiales
Cut edge of the semilunar or bicipital fascia
Radial recurrent vein
V. recurrens radialis
Divided communicating branch between the (deep) radial veins and the superficial veins[9]
Radial artery and (deep) radial veins[10]
A. radialis et Vv. radiales
Median artery and vein[11]
A. et V. mediana
Pronator radii teres muscle (distal extremity)
Flexor profundus digitorum muscle[12]
M. flexor digitorum profundus
Supinator radii longus muscle
M. brachioradialis
Flexor carpi radialis muscle
Palmaris longus muscle
Radial vein[13]
V. cephalica
Divided communicating branches between the deep and the superficial veins
Superficial volar artery[14]
Ramus volaris superficialis arteriæ radialis
Superficial palmar venous arch
Arcus volaris venosus superficialis
Median nerve
N. medianus
Anastomotic branch of brachial artery and vein (anastomotica magna artery and vein)[1]
A. et V. collateralis ulnaris inferior
Divided communicating branch between the superficial and the deep veins
Brachialis anticus muscle
M. brachialis
Anterior ulnar recurrent artery and vein
A. et V. recurrens ulnaris
Ulnar head
Caput ulnare
Humeral head
Caput humerale
of the pronator radii teres muscle
musculi pronatoris radii teretis
Ulnar artery and (deep) ulnar veins[2]
A. ulnaris et Vv. ulnares
Flexor carpi radialis muscle
Palmaris longus muscle
Flexor sublimis digitorum muscle[3]
M. flexor digitorum sublimis
Flexor carpi ulnaris muscle
Flexor sublimis digitorum muscle[3]
M. flexor digitorum sublimis
Ulnar artery and (deep) ulnar veins[2]
A. ulnaris et Vv. ulnares
Anterior annular ligament of the wrist (deep layer)[4]
Lig. carpi transversum
Anterior ulnar vein[5]
V. basilica
Palmar digital arteries and veins[3]
Aa. et Vv. digitales volares communes
1/2
Lumbricales muscles
*Intercapitular vein[7]
*V. intercapitularis

[1] See Appendix, note [209].
[2] Or *venæ comites of the ulnar artery.*
[3] Or *flexor perforatus* muscle.
[4] See Appendix, note [214].
[5] Or *anterior superficial ulnar vein*, according to Macalister. See Appendix, note [306].
[6] See Appendix, notes [213] and [301].
[7] See Appendix, note [320].
[8] Or *venæ comites of the brachial artery.*
[9] This probably represents the *deep median vein* of English anatomists.—Tr.
[10] Or *venæ comites of the radial artery.*
[11] Called by Macalister *comes nervi mediani artery* and *vein.*
[12] Or *flexor perforans* muscle.
[13] Or *superficial radial vein*, according to Macalister. See Appendix, note [325].
[14] Often known in England by the Latin name of *superficialis volæ artery.*

FIG. 1093.—THE DEEP VEINS AND ARTERIES OF THE FLEXURE OF THE ELBOW AND OF THE PALMAR SURFACE OF THE FOREARM; THE SUPERFICIAL PALMAR ARTERIAL AND VENOUS ARCHES.

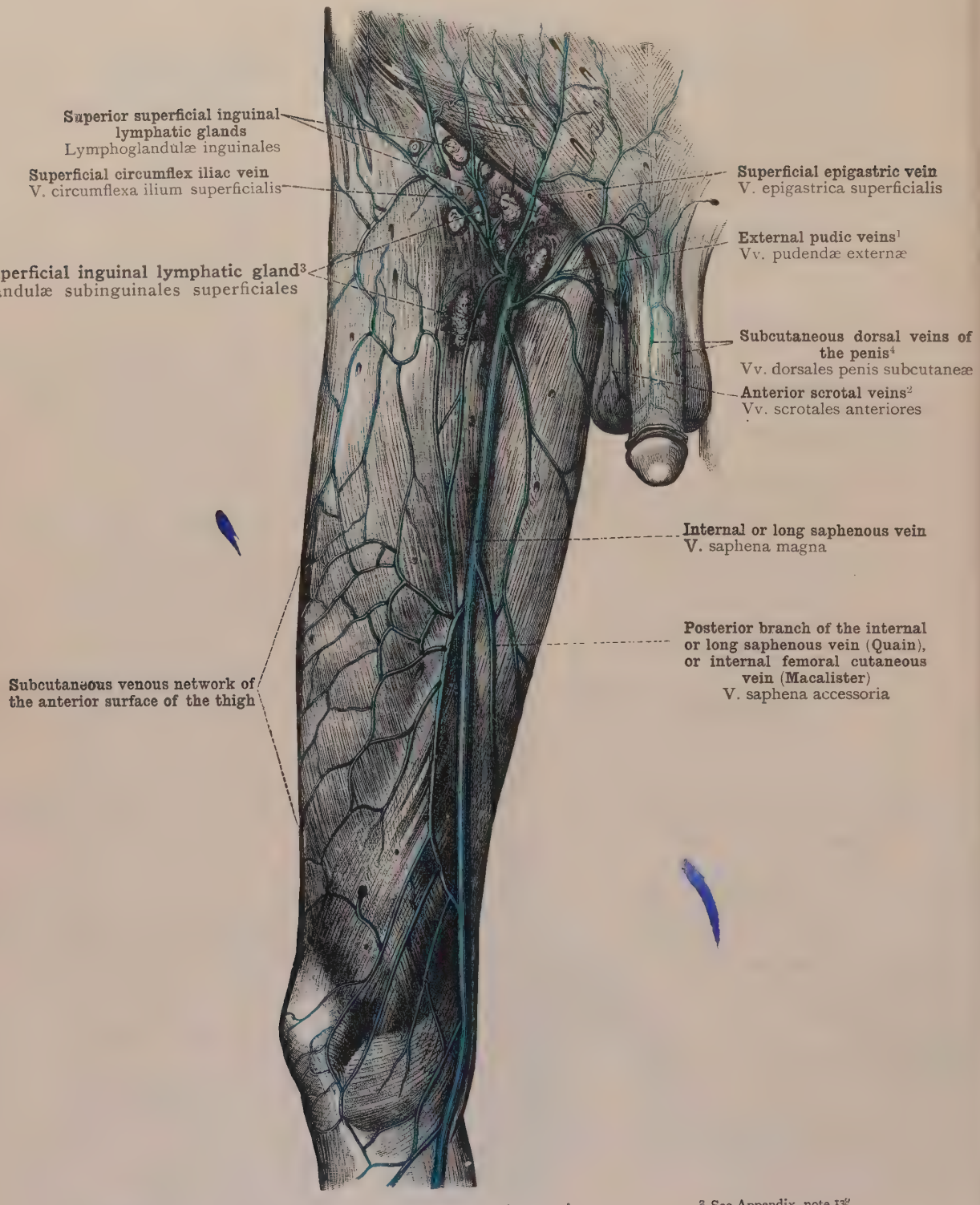
Deep Veins of the Forearm and Hand.


Median nerve
N. medianus
Biceps flexor cubiti muscle
M. biceps brachii
Anastomotic branch of the brachial artery and vein (anastomotica magna artery and ve.n)[1]—A. et V. collateralis ulnaris inferior
Musculospiral nerve
N. radialis
Brachial artery and brachial veins[5]
A. brachialis et Vv. brachiales
Radial nerve
Ramus superficialis nervi radialis
Posterior interosseous nerve—Ramus profundus nervi radialis
Brachialis anticus muscle
M. brachialis
Radial recurrent artery and vein
A. et V. recurrens radialis
Anterior ulnar recurrent artery and vein
A. et V. recurrens ulnaris
Supinator radii brevis muscle
M. supinator
Ulnar artery and (deep) ulnar veins[2]
A. ulnaris et Vv. ulnares
Extensor carpi radialis longior muscle
M. extensor carpi radialis longus
Pronator radii teres muscle
M. pronator teres
Pronator radii teres muscle (distal extremity)
Flexor carpi radialis muscle
Radial artery and (deep) radial veins[6]
A. radialis et Vv. radiales
Palmaris longus muscle
Supinator radii longus muscle
M. brachioradialis
Flexor carpi ulnaris muscle
Radial head of the flexor sublimis digitorum muscle (the rest of the muscle has been cut away)
Flexor profundus digitorum muscle[3]
M. flexor digitorum profundus
Flexor carpi ulnaris muscle
Anterior interosseous artery and anterior interosseous veins[7]
A. et Vv. interosseæ volares
Flexor longus pollicis muscle
M. flexor pollicis longus
1/2
Pronator quadratus muscle (divided by a vertical incision) the segments being drawn apart
Anterior radial carpal branch
Ramus carpeus volaris arteriæ radialis
Superficial volar artery[8]
Ramus volaris superficialis
Anterior ulnar carpal branch
Ramus carpeus volaris arteriæ ulnaris
Abductor pollicis muscle
M. abductor pollicis brevis
Deep palmar venous arch
Arcus volaris venosus profundus
Opponens pollicis muscle
Large artery of the thumb and companion veins[9]
A. princeps pollicis et venæ comitantes
Abductor minimi digiti muscle
M. abductor digiti V.
First dorsal interosseous or abductor indicis muscle—M. interosseus dorsalis I.
Fourth dorsal interosseous muscle
M. interosseus dorsalis IV.
Palmar interosseous veins and arteries[10]
Vv. et Aa. metacarpeæ volares
*Intercapitular veins[4]
*Vv. intercapitulares
Second palmar interosseous muscle
M. interosseus volaris II.

1 See Appendix, note 209.
2 Or *venæ comites of the ulnar artery.*
3 Or *flexor perforans* muscle.
4 See Appendix, note 300.
5 Or *venæ comites of the brachial artery.*
6 Or *venæ comites of the radial artery.*
7 Or *venæ comites of the anterior interosseous artery.*
8 See note 14 to p. 700.
9 Or *princeps pollicis artery* and *veins.*
10 Called by Macalister the *descending digital branches* of the *deep palmar arch.*

FIG. 1094.—THE DEEP VEINS AND ARTERIES OF THE FLEXURE OF THE ELBOW, AND THEIR CONNEXION WITH THE DEEP VEINS OF THE PALMAR SURFACE OF THE FOREARM; THE DEEP PALMAR ARTERIAL AND VENOUS ARCHES.

Deep Veins of the Forearm and Hand.


Superior superficial inguinal lymphatic glands
Lymphoglandulæ inguinales
Superficial circumflex iliac vein
V. circumflexa ilium superficialis
Inferior superficial inguinal lymphatic gland[3]
Lymphoglandulæ subinguinales superficiales
Superficial epigastric vein
V. epigastrica superficialis
External pudic veins[1]
Vv. pudendæ externæ
Subcutaneous dorsal veins of the penis[4]
Vv. dorsales penis subcutaneæ
Anterior scrotal veins[2]
Vv. scrotales anteriores
Internal or long saphenous vein
V. saphena magna
Posterior branch of the internal or long saphenous vein (Quain), or internal femoral cutaneous vein (Macalister)
V. saphena accessoria
Subcutaneous venous network of the anterior surface of the thigh

1 According to Macalister, *pubic* tributaries of the internal or long saphenous vein.
3 Often called the *femoral lymphatic glands*.

2 See Appendix, note 132.
4 See Appendix, note 274.

FIG. 1095.—THE CUTANEOUS VEINS OF THE ANTERIOR AND INNER SIDES OF THE RIGHT THIGH, OF THE LOWER PART OF THE FRONT OF THE ABDOMEN, AND OF THE MALE EXTERNAL GENITAL ORGANS. THE INTERNAL OR LONG SAPHENOUS VEIN WITH ITS POSTERIOR BRANCH (THE INTERNAL FEMORAL CUTANEOUS VEIN, ACCORDING TO MACALISTER), VENA SAPHENA MAGNA ET VENA SAPHENA ACCESSORIA; THE SUPERFICIAL LYMPHATIC GLANDS OF THE INGUINAL AND SUBINGUINAL REGIONS.

Cutaneous Veins of the Lower Limb.

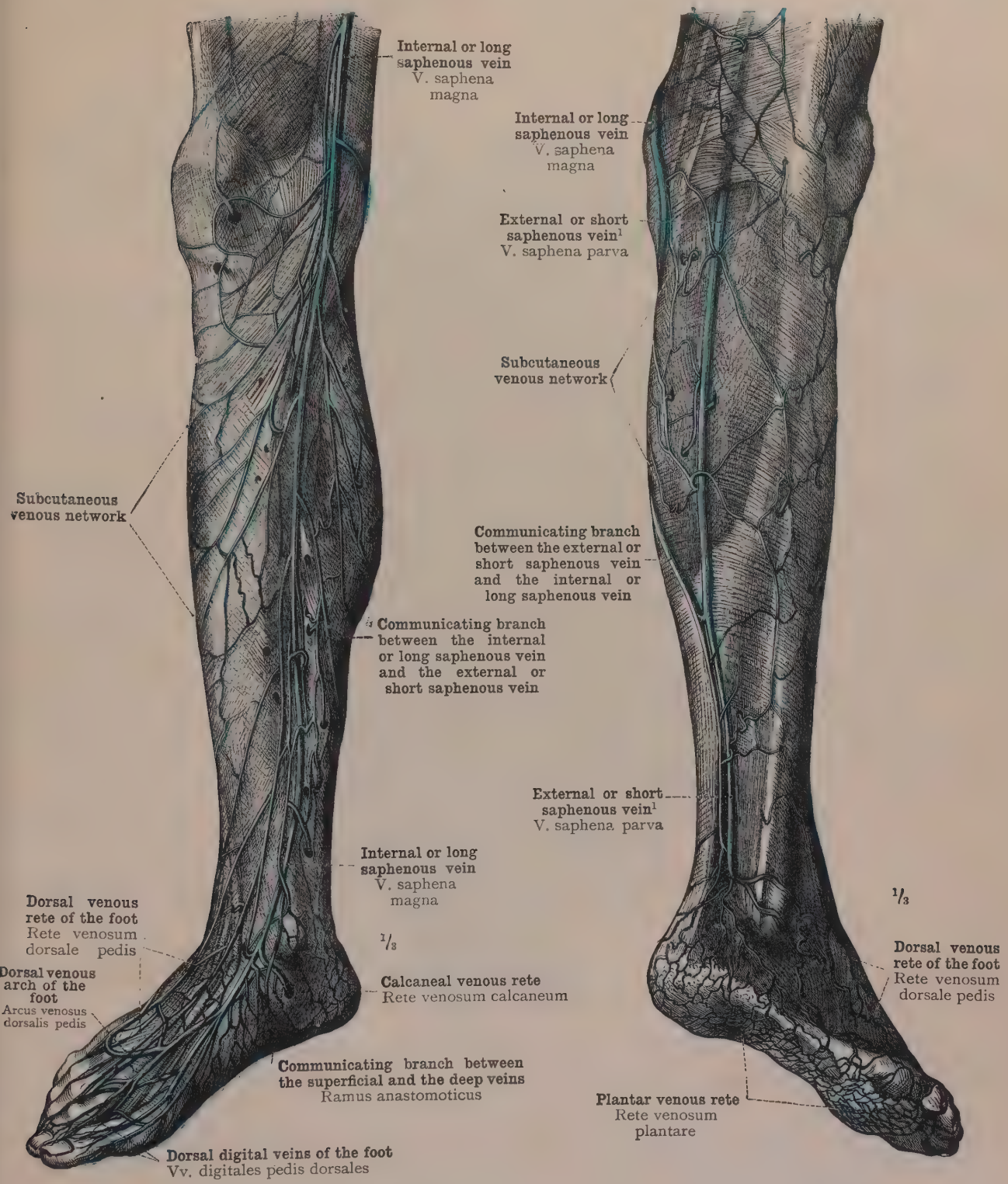
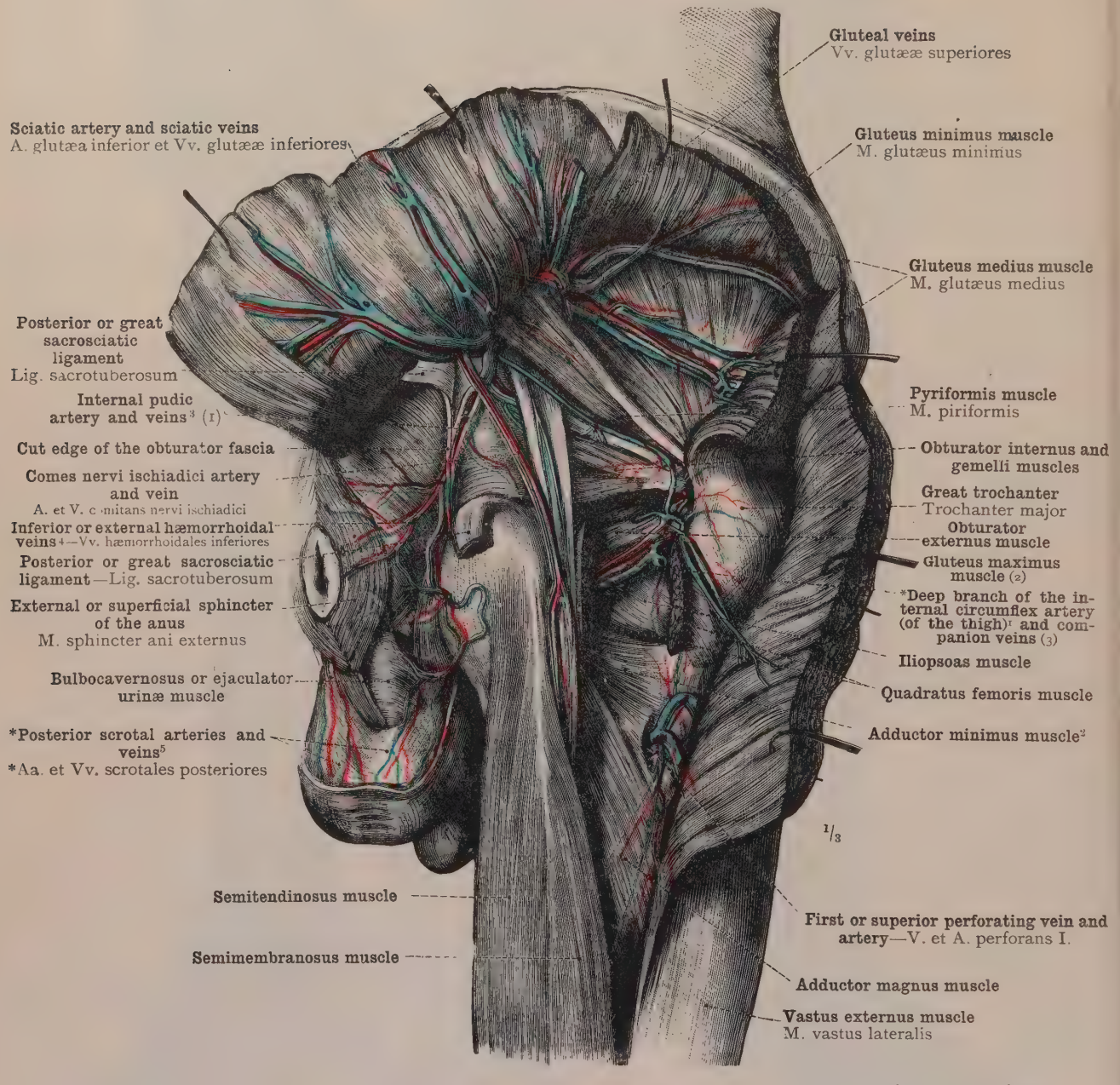

Internal or long saphenous vein
V. saphena magna
Subcutaneous venous network
Communicating branch between the internal or long saphenous vein and the external or short saphenous vein
Internal or long saphenous vein
V. saphena magna
Dorsal venous rete of the foot
Rete venosum dorsale pedis
Dorsal venous arch of the foot
Arcus venosus dorsalis pedis
1/3
Calcaneal venous rete
Rete venosum calcaneum
Communicating branch between the superficial and the deep veins
Ramus anastomoticus
Dorsal digital veins of the foot
Vv. digitales pedis dorsales
Internal or long saphenous vein
V. saphena magna
External or short saphenous vein[1]
V. saphena parva
Subcutaneous venous network
Communicating branch between the external or short saphenous vein and the internal or long saphenous vein
External or short saphenous vein[1]
V. saphena parva
1/3
Dorsal venous rete of the foot
Rete venosum dorsale pedis
Plantar venous rete
Rete venosum plantare

FIG. 1096.—SEEN FROM THE FRONT AND THE INNER SIDE.

FIG. 1097.—SEEN FROM BEHIND AND THE OUTER SIDE.

THE CUTANEOUS VEINS OF THE LEG AND THE FOOT: THE INTERNAL OR LONG SAPHENOUS VEIN, VENA SAPHENA MAGNA, AND THE EXTERNAL OR SHORT SAPHENOUS VEIN, VENA SAPHENA PARVA, WITH THE TRIBUTARIES OF THESE VEINS

[1] Called by Macalister the *sural vein*.


Gluteal veins
Vv. glutææ superiores
Sciatic artery and sciatic veins
A. glutæa inferior et Vv. glutææ inferiores
Gluteus minimus muscle
M. glutæus minimus
Gluteus medius muscle
M. glutæus medius
Posterior or great sacrosciatic ligament
Lig. sacrotuberosum
Internal pudic artery and veins[3] (1)
Pyriformis muscle
M. piriformis
Cut edge of the obturator fascia
Obturator internus and gemelli muscles
Comes nervi ischiadici artery and vein
A. et V. comitans nervi ischiadici
Great trochanter
Trochanter major
Inferior or external hæmorrhoidal veins[4]—Vv. hæmorrhoidales inferiores
Obturator externus muscle
Posterior or great sacrosciatic ligament—Lig. sacrotuberosum
Gluteus maximus muscle (2)
External or superficial sphincter of the anus
M. sphincter ani externus
*Deep branch of the internal circumflex artery (of the thigh)[1] and companion veins (3)
Iliopsoas muscle
Bulbocavernosus or ejaculator urinæ muscle
Quadratus femoris muscle
*Posterior scrotal arteries and veins[5]
*Aa. et Vv. scrotales posteriores
Adductor minimus muscle[2]
1/3
Semitendinosus muscle
First or superior perforating vein and artery—V. et A. perforans I.
Semimembranosus muscle
Adductor magnus muscle
Vastus externus muscle
M. vastus lateralis

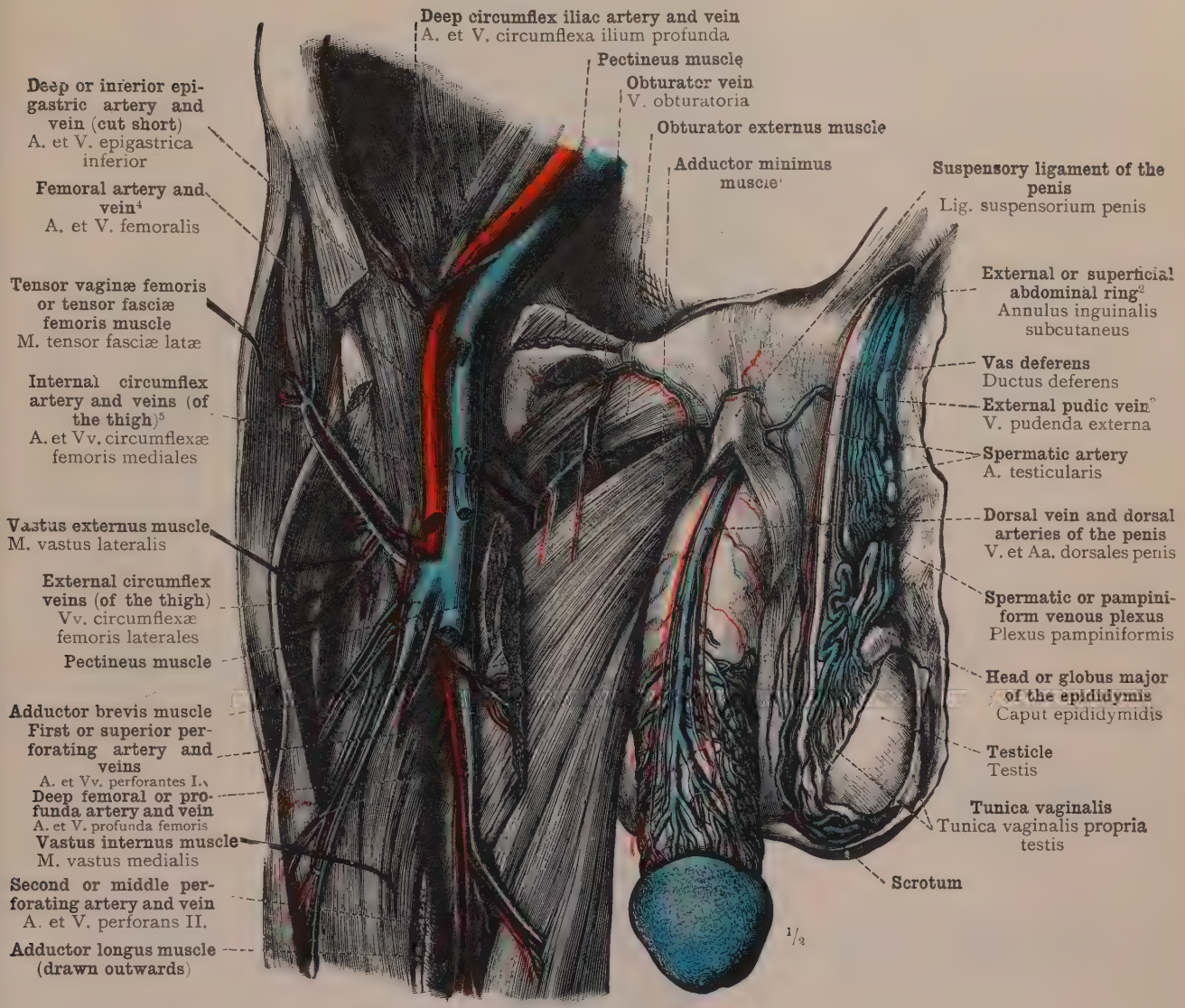
(1) A. et Vv. pudendæ internæ (2) M. glutæus maximus (3) *Ramus profundus arteriæ circumflexæ femoris medialis et venæ comitantes

[1] The so-called **deep branch of the internal circumflex artery* is by English anatomists regarded as the continuation of that vessel itself. See Appendix, note [224].
[2] See note [2] to p. 644.
[3] See Appendix, note [139].
[4] Called by Macalister the *anal veins*.
[5] See Appendix, note [138].

FIG. 1098.—THE DEEP VEINS AND ARTERIES OF THE RIGHT GLUTEAL REGION AND ISCHIORECTAL FOSSA, WITH THE SUPERFICIAL VESSELS OF THE POSTERIOR SURFACE OF THE SCROTUM.

The gluteus maximus and gluteus medius muscles and the posterior or great sacrosciatic ligament were cut across and the segments were drawn apart, and the greater part of the quadratus femoris muscle was cut away.

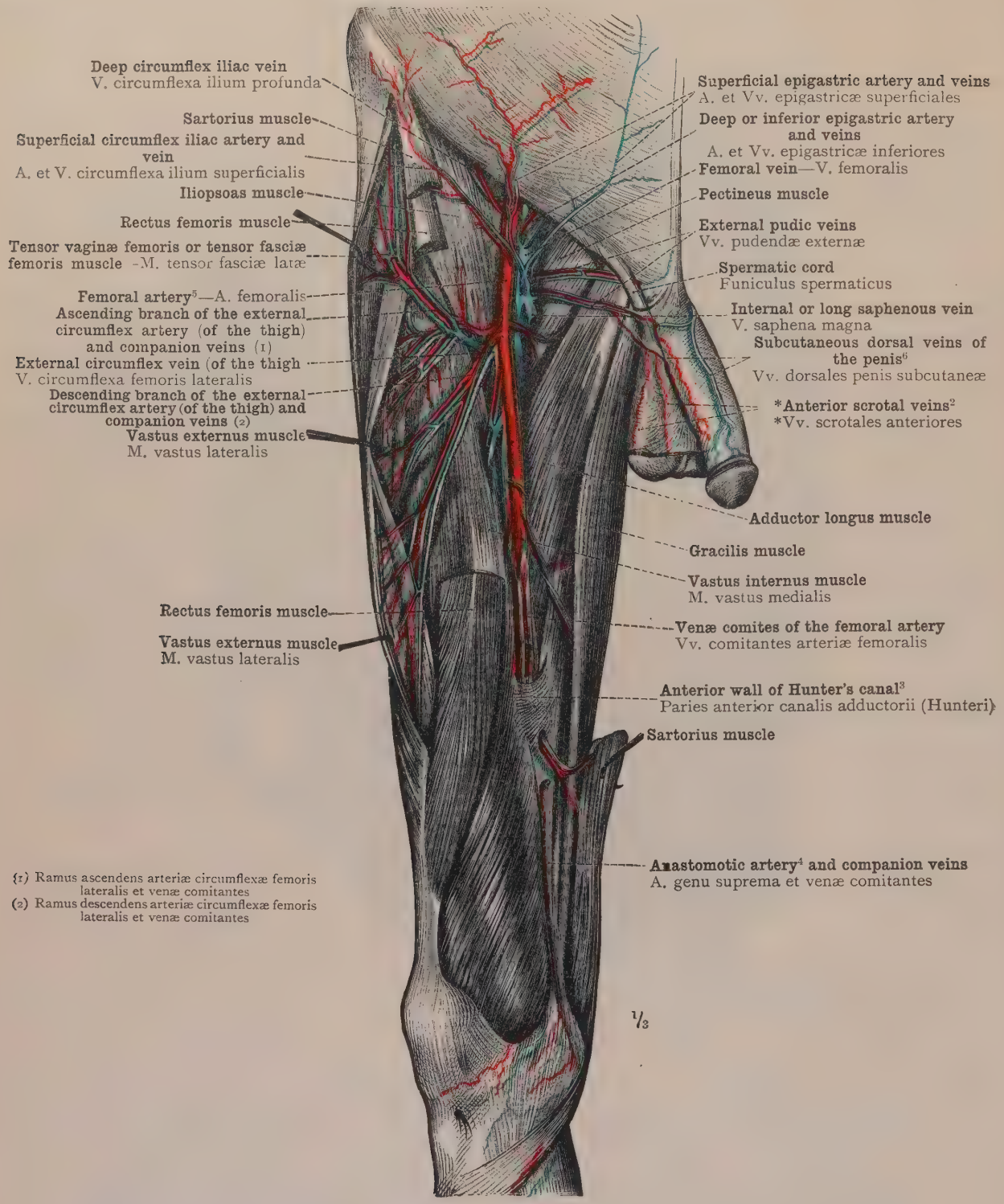
Deep Veins of the Gluteal Region.


Deep circumflex iliac artery and vein
A. et V. circumflexa ilium profunda
Pectineus muscle
Obturator vein
V. obturatoria
Obturator externus muscle
Adductor minimus muscle[1]
Suspensory ligament of the penis
Lig. suspensorium penis
Deep or inferior epigastric artery and vein (cut short)
A. et V. epigastrica inferior
Femoral artery and vein[4]
A. et V. femoralis
Tensor vaginæ femoris or tensor fasciæ femoris muscle
M. tensor fasciæ latæ
Internal circumflex artery and veins (of the thigh)[5]
A. et Vv. circumflexæ femoris mediales
Vastus externus muscle
M. vastus lateralis
External circumflex veins (of the thigh)
Vv. circumflexæ femoris laterales
Pectineus muscle
Adductor brevis muscle
First or superior perforating artery and veins
A. et Vv. perforantes I.
Deep femoral or profunda artery and vein
A. et V. profunda femoris
Vastus internus muscle
M. vastus medialis
Second or middle perforating artery and vein
A. et V. perforans II.
Adductor longus muscle (drawn outwards)
Terminal portion of the deep femoral or profunda artery and vein (third or inferior perforating artery and vein)[6]
External or superficial abdominal ring[2]
Annulus inguinalis subcutaneus
Vas deferens
Ductus deferens
External pudic vein[3]
V. pudenda externa
Spermatic artery
A. testicularis
Dorsal vein and dorsal arteries of the penis
V. et Aa. dorsales penis
Spermatic or pampiniform venous plexus
Plexus pampiniformis
Head or globus major of the epididymis
Caput epididymidis
Testicle
Testis
Tunica vaginalis
Tunica vaginalis propria testis
Scrotum
1/2

[1] See note [2] to p. 644
[2] Or *external inguinal aperture.*
[3] Called by Macalister *pubic vein.*
[4] See Appendix, note [223].
[5] See Appendix, note [224].
[6] See Appendix, note [312].

FIG. 1099.—THE DISTRIBUTION OF THE DEEP FEMORAL OR PROFUNDA VEIN AND ARTERY, VENA ET ARTERIA PROFUNDA FEMORIS; OF THE OBTURATOR VESSELS, VASA OBTURATORIA; OF THE DORSAL VESSELS OF THE PENIS; AND OF THE VEINS OF THE TESTICLE.

The anterior wall of the abdomen was removed, together with Poupart's ligament (the superficial crural arch); the pectineus, adductor brevis, and adductor longus muscles were cut away close to their origin, in order to expose the obturator and the internal circumflex vessels. On the right side, the testis and the spermatic cord were removed: while on the left side these organs were retained, and the spermatic or pampiniform venous plexus was dissected out. On the penis, which was injected both by way of the dorsal vein and by penetration of one of the corpora cavernosa, the deep-seated dorsal vessels were exposed.


Deep circumflex iliac vein
V. circumflexa ilium profunda
Sartorius muscle
Superficial circumflex iliac artery and vein
A. et V. circumflexa ilium superficialis
Iliopsoas muscle
Rectus femoris muscle
Tensor vaginæ femoris or tensor fasciæ femoris muscle -M. tensor fasciæ latæ
Femoral artery[5]—A. femoralis
Ascending branch of the external circumflex artery (of the thigh) and companion veins (1)
External circumflex vein (of the thigh
V. circumflexa femoris lateralis
Descending branch of the external circumflex artery (of the thigh) and companion veins (2)
Vastus externus muscle
M. vastus lateralis
Rectus femoris muscle
Vastus externus muscle
M. vastus lateralis
Superficial epigastric artery and veins
A. et Vv. epigastricæ superficiales
Deep or inferior epigastric artery and veins
A. et Vv. epigastricæ inferiores
Femoral vein—V. femoralis
Pectineus muscle
External pudic veins
Vv. pudendæ externæ
Spermatic cord
Funiculus spermaticus
Internal or long saphenous vein
V. saphena magna
Subcutaneous dorsal veins of the penis[6]
Vv. dorsales penis subcutaneæ
*Anterior scrotal veins[2]
*Vv. scrotales anteriores
Adductor longus muscle
Gracilis muscle
Vastus internus muscle
M. vastus medialis
Venæ comites of the femoral artery
Vv. comitantes arteriæ femoralis
Anterior wall of Hunter's canal[3]
Paries anterior canalis adductorii (Hunteri)
Sartorius muscle
Anastomotic artery[4] and companion veins
A. genu suprema et venæ comitantes
1/3

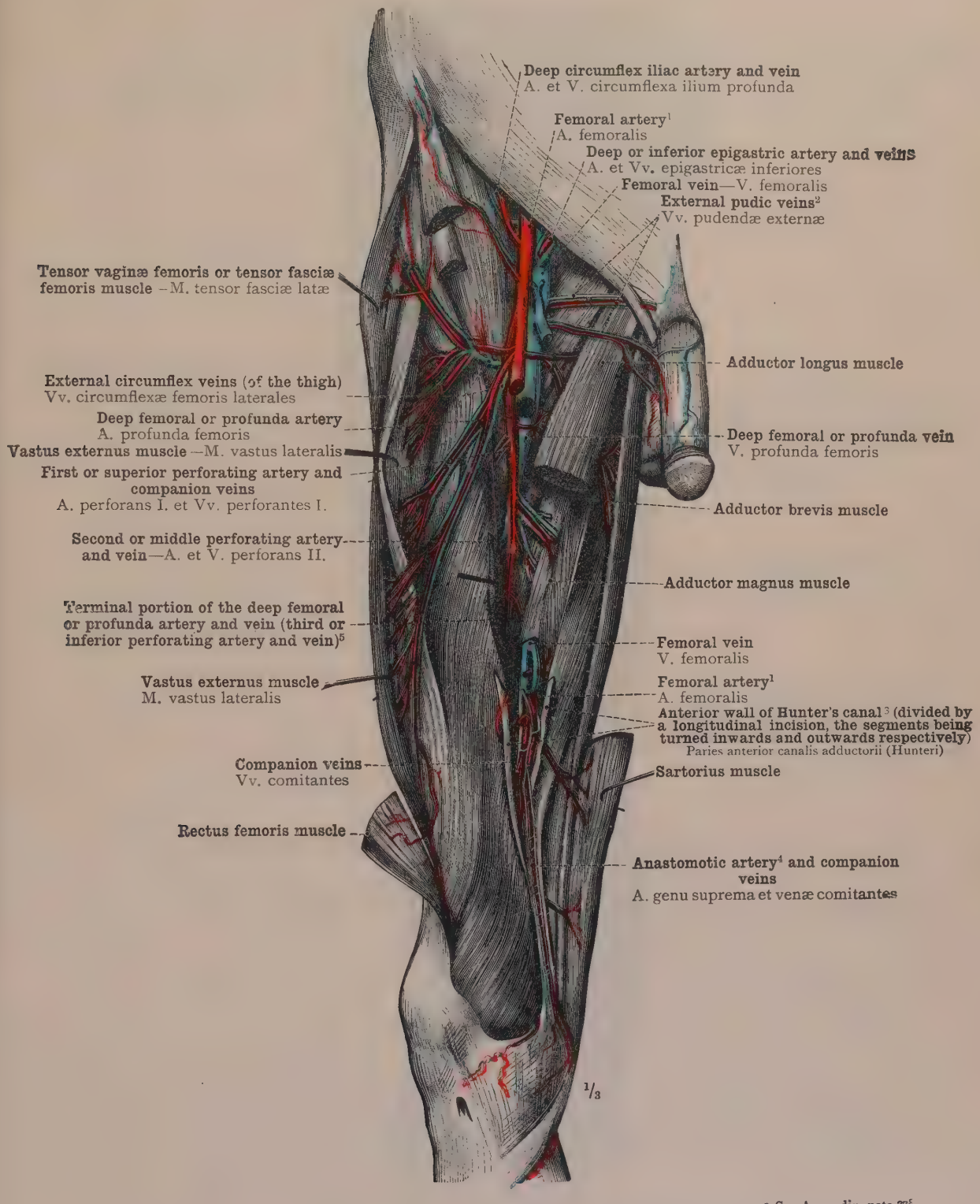
(1) Ramus ascendens arteriæ circumflexæ femoris lateralis et venæ comitantes
(2) Ramus descendens arteriæ circumflexæ femoris lateralis et venæ comitantes

1 Or *pubic veins*, according to Macalister.
2 See Appendix, note 138.
3 See Appendix, note 228.
4 See Appendix, note 226.
5 See Appendix, note 223.
6 See Appendix, note 274.

FIG. 1100.—THE FEMORAL ARTERY AND VEIN, ARTERIA ET VENA FEMORALIS, UNTIL THEIR ENTRANCE INTO HUNTER'S CANAL (*see Appendix, note* 228), AND THE DISTRIBUTION OF THE EXTERAL CIRCUMFLEX ARTERY AND VEIN (OF THE THIGH), ARTERIA ET VENA CIRCUMFLEXA FEMORIS LATERALIS. RIGHT THIGH, SEEN FROM BEFORE.

The sartorius and rectus femoris muscles were in part removed, and the tensor vaginæ femoris and vastus externus muscles were drawn outwards.

Deep Veins of the Front of the Thigh.

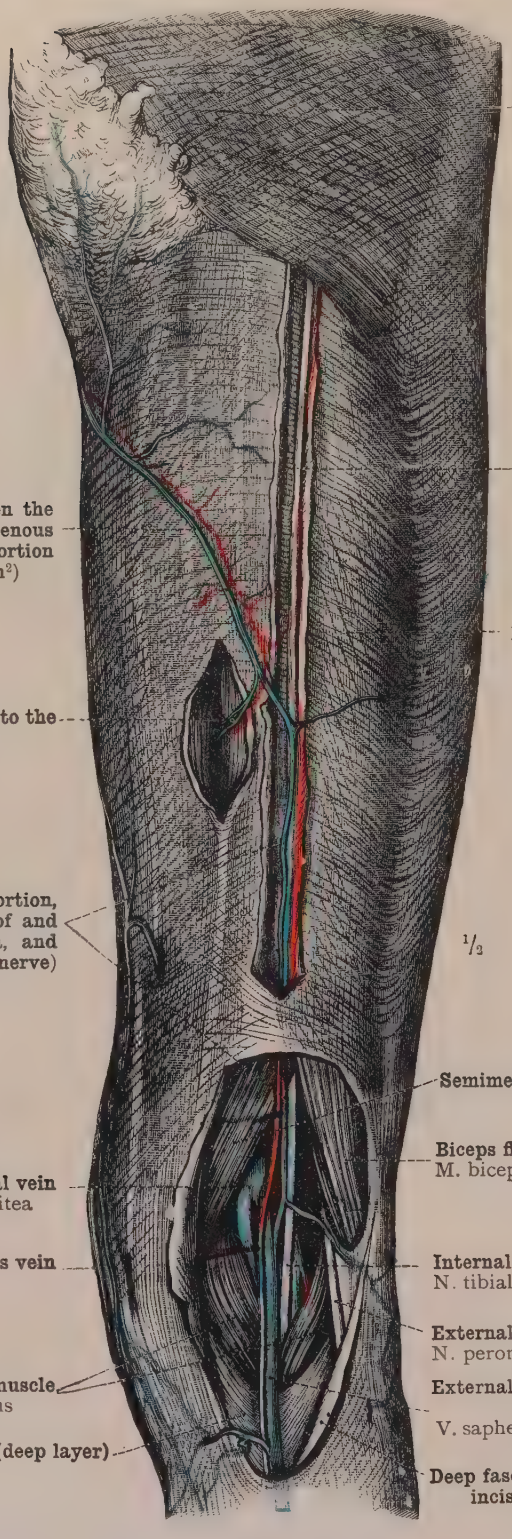

Deep circumflex iliac artery and vein
A. et V. circumflexa ilium profunda
Femoral artery[1]
A. femoralis
Deep or inferior epigastric artery and veins
A. et Vv. epigastricæ inferiores
Femoral vein—V. femoralis
External pudic veins[2]
Vv. pudendæ externæ
Tensor vaginæ femoris or tensor fasciæ femoris muscle—M. tensor fasciæ latæ
Adductor longus muscle
External circumflex veins (of the thigh)
Vv. circumflexæ femoris laterales
Deep femoral or profunda artery
A. profunda femoris
Vastus externus muscle—M. vastus lateralis
Deep femoral or profunda vein
V. profunda femoris
First or superior perforating artery and companion veins
A. perforans I. et Vv. perforantes I.
Adductor brevis muscle
Second or middle perforating artery and vein—A. et V. perforans II.
Adductor magnus muscle
Terminal portion of the deep femoral or profunda artery and vein (third or inferior perforating artery and vein)[5]
Femoral vein
V. femoralis
Vastus externus muscle
M. vastus lateralis
Femoral artery[1]
A. femoralis
Anterior wall of Hunter's canal[3] (divided by a longitudinal incision, the segments being turned inwards and outwards respectively)
Paries anterior canalis adductorii (Hunteri)
Companion veins
Vv. comitantes
Sartorius muscle
Rectus femoris muscle
Anastomotic artery[4] and companion veins
A. genu suprema et venæ comitantes
1/3

1 See Appendix, note 223. 2 Called by Macalister the *pubic veins*. 3 See Appendix, note 228.
4 See Appendix, note 226. 5 See Appendix, note 312.

FIG. 1101.—THE DEEP FEMORAL OR PROFUNDA ARTERY AND ITS COMPANION VEINS; RIGHT THIGH, SEEN FROM BEFORE.

In the preparation shown in Fig. 1100, a portion of the (superficial) femoral artery and vein were excised, part of the adductor longus muscle was removed, and Hunter's canal was opened from before.

Deep Veins of the Front of the Thigh.



Deep fascia of the buttock, or gluteal portion of the fascia lata
Fascia glutæa

Small sciatic nerve and companion artery[1]
N. cutaneus femoris posterior et arteria comitans

Communicating branch between the external and the internal saphenous veins (proximal subcutaneous portion of the *femoropopliteal vein[2])

Deep fascia of the thigh, or fascia lata

Communicating branch to the deep veins

*Femoropopliteal vein[2] (distal portion, lying partly in the substance of and partly beneath the fascia lata, and accompanying the small sciatic nerve)
*Vena femoropoplitea

1/2

Semimembranosus muscle

Biceps flexor cruris muscle
M. biceps femoris

Popliteal vein
V. poplitea

Internal or long saphenous vein
V. saphena magna

Internal popliteal nerve
N. tibialis

External popliteal or peroneal nerve
N. peronæus communis

Gastrocnemius muscle
M. gastrocnemius

External or short saphenous vein and small sciatic nerve
V. saphena parva et nervus cutaneus femoris posterior

Deep fascia of the leg (deep layer)
Fascia cruris

Deep fascia of the leg (superficial layer, incised and turned backwards)
Fascia cruris

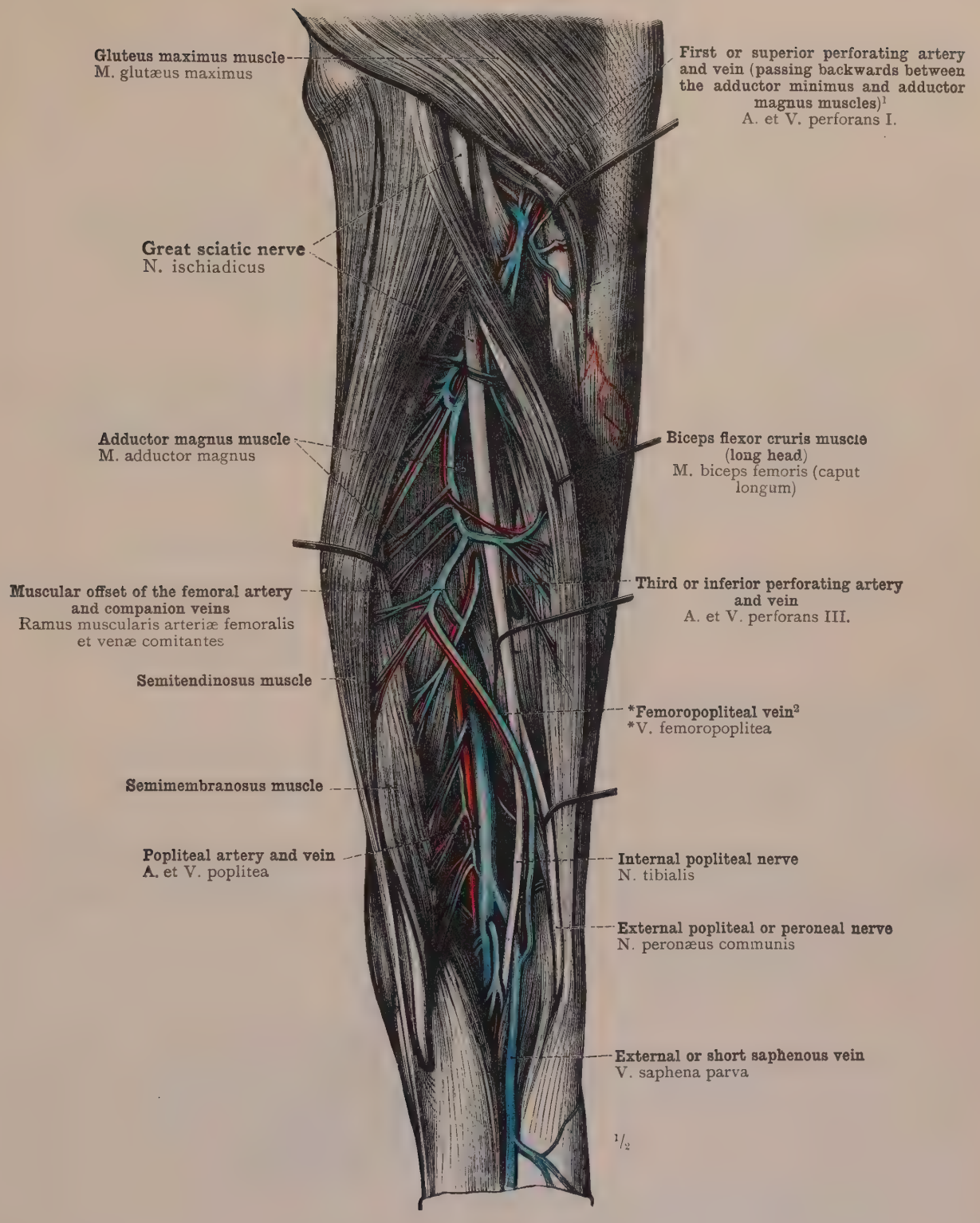
[1] This artery is one of the *cutaneous* branches of the *sciatic artery*.—Tr.

[2] See Appendix, note 313.

FIG 1102.—THE *FEMOROPOPLITEAL VEIN, *VENA FEMOROPOPLITEA (*see Appendix, note* 313), OF THE RIGHT THIGH.

The small sciatic nerve (nervus cutaneus femoris posterior), with its companion vessels, was exposed in its course between the layers of the fascia lata along the middle of the back of the thigh; and in the region of the ham the deep fascia was entirely removed.

Superficial Veins of the Back of the Thigh.


Gluteus maximus muscle
M. glutæus maximus
First or superior perforating artery and vein (passing backwards between the adductor minimus and adductor magnus muscles)[1]
A. et V. perforans I.
Great sciatic nerve
N. ischiadicus
Adductor magnus muscle
M. adductor magnus
Biceps flexor cruris muscle (long head)
M. biceps femoris (caput longum)
Muscular offset of the femoral artery and companion veins
Ramus muscularis arteriæ femoralis et venæ comitantes
Third or inferior perforating artery and vein
A. et V. perforans III.
Semitendinosus muscle
*Femoropopliteal vein[2]
*V. femoropoplitea
Semimembranosus muscle
Popliteal artery and vein
A. et V. poplitea
Internal popliteal nerve
N. tibialis
External popliteal or peroneal nerve
N. peronæus communis
External or short saphenous vein
V. saphena parva
1/2

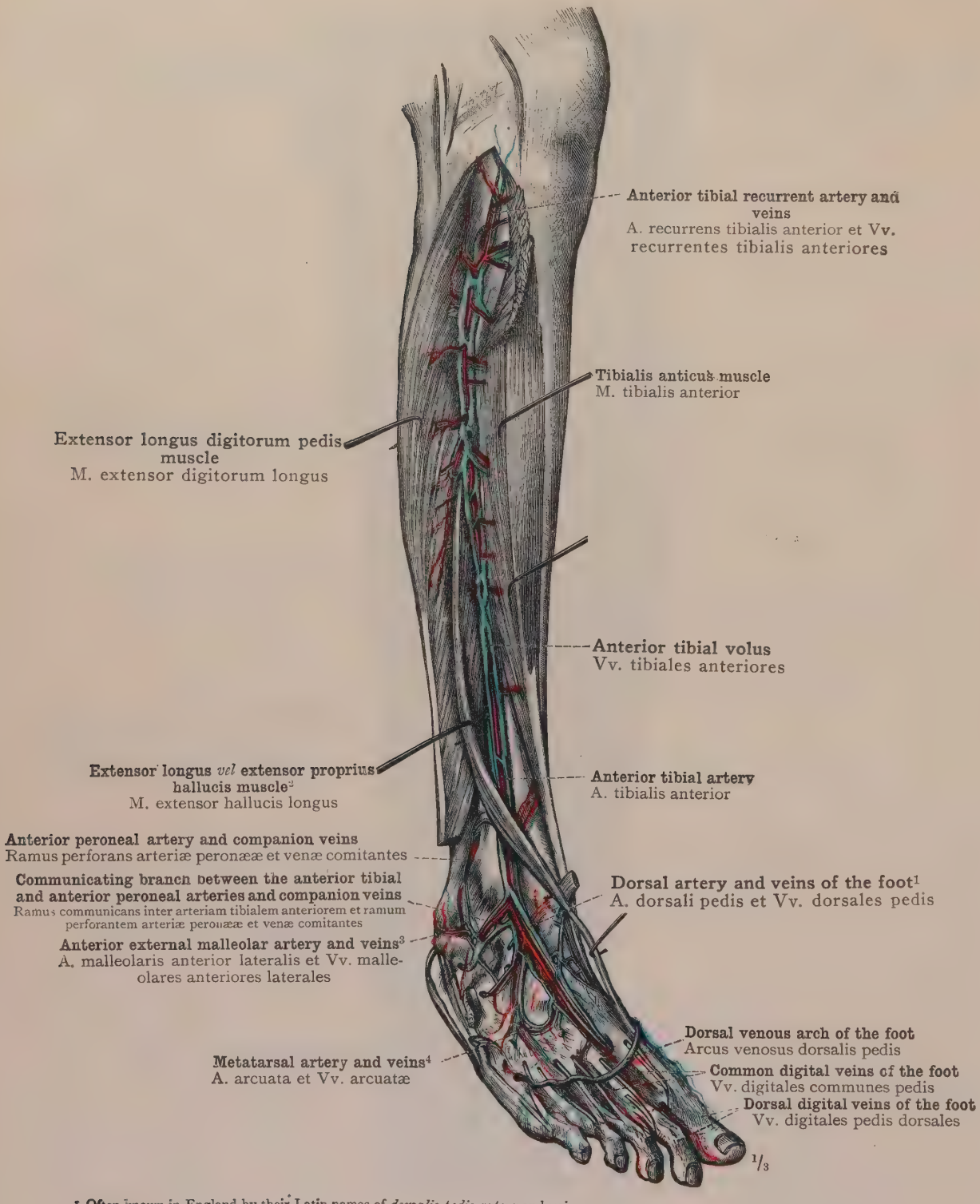
[1] See note [2] to p. 644.

[2] See Appendix, note 313.

FIG. 1103.—THE PERFORATING VEINS, VENÆ PERFORANTES, AND THEIR COMMUNICATION WITH THE EXTERNAL OR SHORT SAPHENOUS VEIN, DISSECTED OUT AT THE BACK OF THE RIGHT THIGH.

The biceps flexor cruris muscle was drawn as far outwards, and the inner hamstring muscles were drawn as far inwards, as possible.

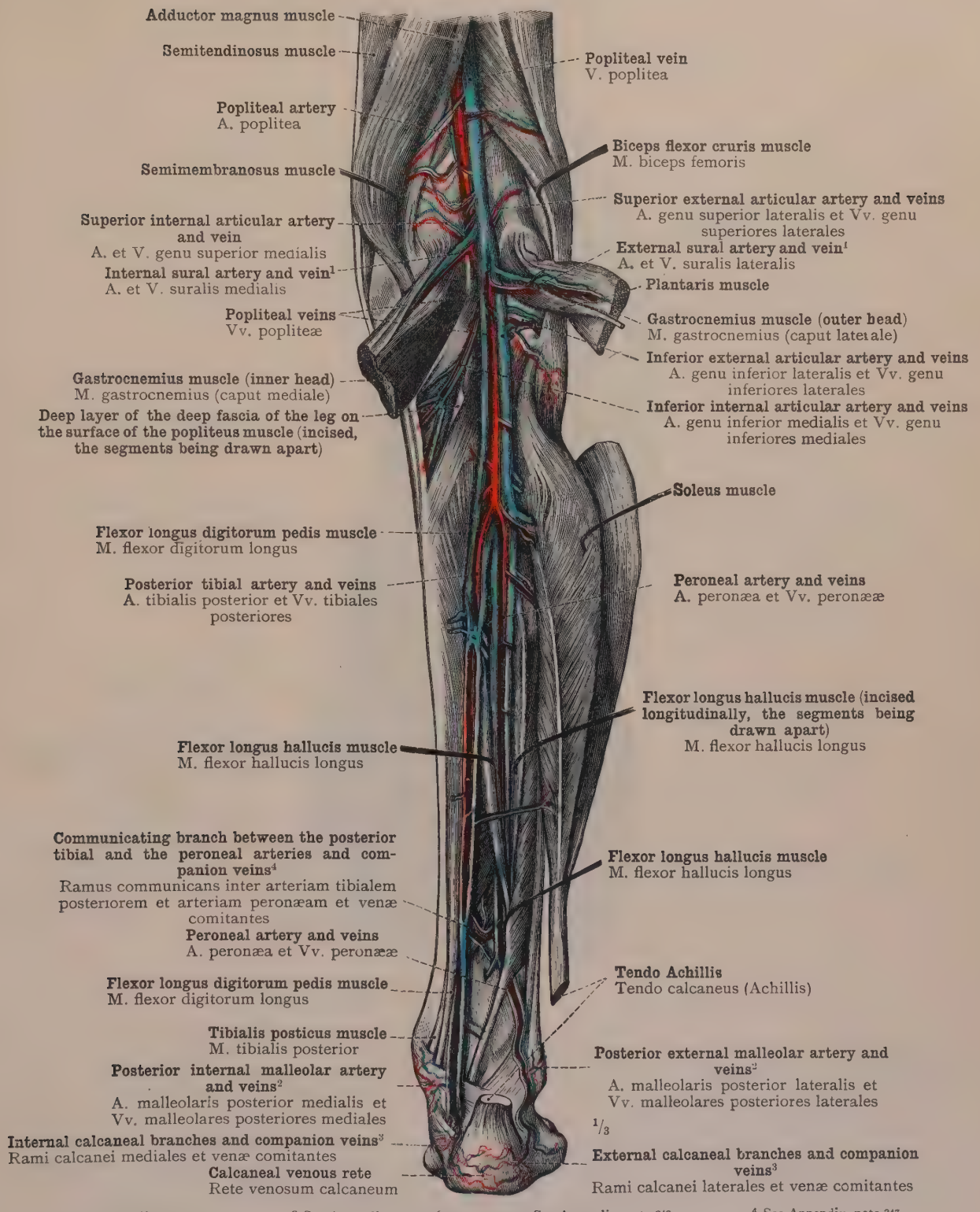
Deep Veins of the Back of the Thigh.


Anterior tibial recurrent artery and veins
A. recurrens tibialis anterior et Vv. recurrentes tibialis anteriores
Tibialis anticus muscle
M. tibialis anterior
Extensor longus digitorum pedis muscle
M. extensor digitorum longus
Anterior tibial volus
Vv. tibiales anteriores
Extensor longus vel extensor proprius hallucis muscle[2]
M. extensor hallucis longus
Anterior tibial artery
A. tibialis anterior
Anterior peroneal artery and companion veins
Ramus perforans arteriæ peronææ et venæ comitantes
Communicating branch between the anterior tibial and anterior peroneal arteries and companion veins
Ramus communicans inter arteriam tibialem anteriorem et ramum perforantem arteriæ peronææ et venæ comitantes
Anterior external malleolar artery and veins[3]
A. malleolaris anterior lateralis et Vv. malleolares anteriores laterales
Dorsal artery and veins of the foot[1]
A. dorsali pedis et Vv. dorsales pedis
Dorsal venous arch of the foot
Arcus venosus dorsalis pedis
Metatarsal artery and veins[4]
A. arcuata et Vv. arcuatæ
Common digital veins of the foot
Vv. digitales communes pedis
Dorsal digital veins of the foot
Vv. digitales pedis dorsales
1/3

[1] Often known in England by their Latin names of *dorsalis pedis artery* and *veins*.
[2] See note [2] to p. 364, in Part III. [3] See Appendix, note [236]. [4] See Appendix, note [239].

FIG. 1104.—THE MUSCLES OF THE FRONT OF THE LEG WERE SEPARATED, THE PROXIMAL PORTION OF THE TIBIALIS ANTICUS MUSCLE WAS DETACHED FROM THE BONE AND TURNED FORWARDS, THE EXTENSOR BREVIS DIGITORUM PEDIS MUSCLE AND THE TENDONS OF THE EXTENSOR LONGUS DIGITORUM PEDIS MUSCLE WERE REMOVED FROM THE DORSUM OF THE TARSUS.

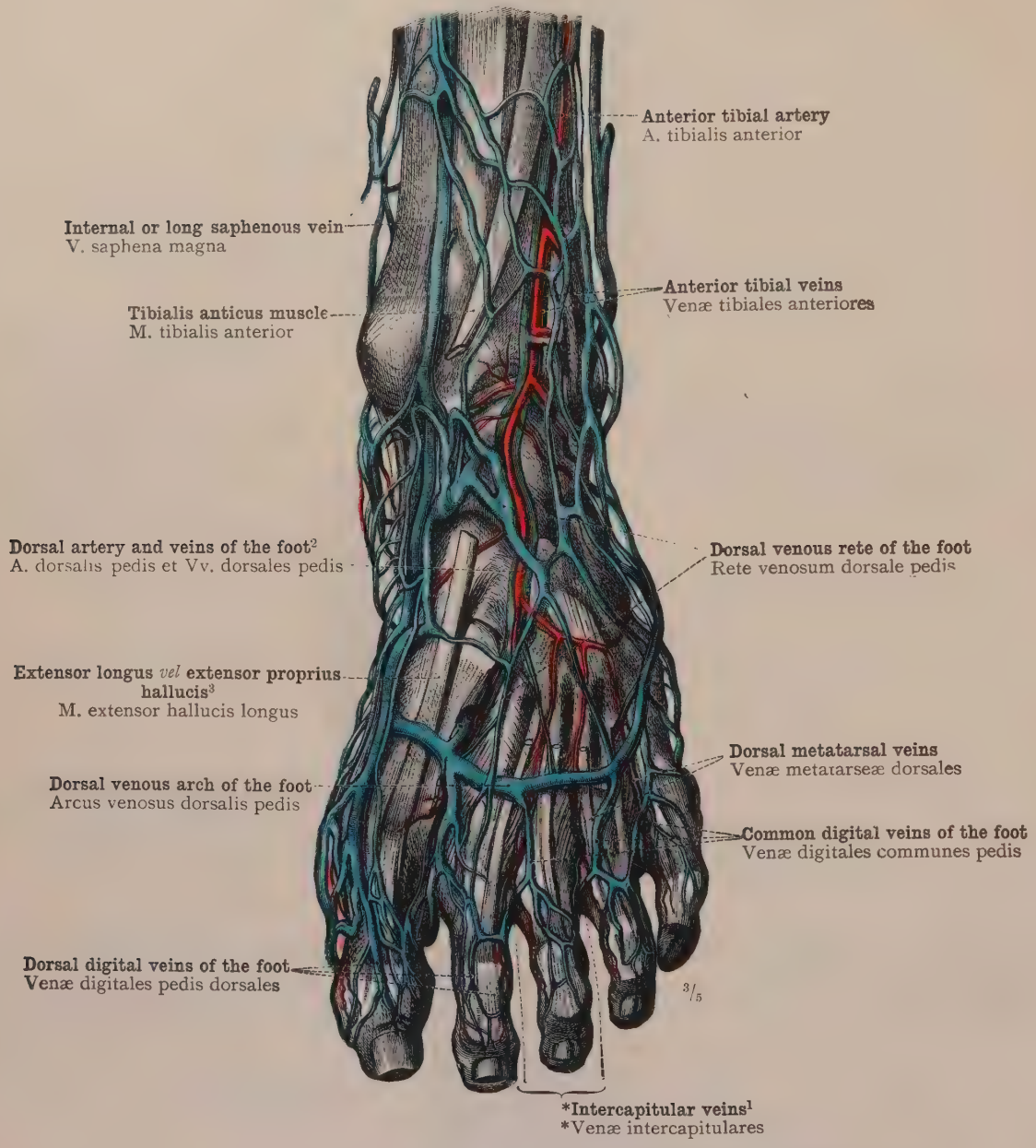
Deep Veins and Arteries of the Front of the Leg and the Dorsum of the Foot.


Adductor magnus muscle
Semitendinosus muscle
Popliteal vein
V. poplitea
Popliteal artery
A. poplitea
Biceps flexor cruris muscle
M. biceps femoris
Semimembranosus muscle
Superior external articular artery and veins
A. genu superior lateralis et Vv. genu superiores laterales
Superior internal articular artery and vein
A. et V. genu superior medialis
External sural artery and vein[1]
A. et V. suralis lateralis
Internal sural artery and vein[1]
A. et V. suralis medialis
Plantaris muscle
Popliteal veins
Vv. popliteæ
Gastrocnemius muscle (outer head)
M. gastrocnemius (caput laterale)
Inferior external articular artery and veins
A. genu inferior lateralis et Vv. genu inferiores laterales
Gastrocnemius muscle (inner head)
M. gastrocnemius (caput mediale)
Deep layer of the deep fascia of the leg on the surface of the popliteus muscle (incised, the segments being drawn apart)
Inferior internal articular artery and veins
A. genu inferior medialis et Vv. genu inferiores mediales
Soleus muscle
Flexor longus digitorum pedis muscle
M. flexor digitorum longus
Posterior tibial artery and veins
A. tibialis posterior et Vv. tibiales posteriores
Peroneal artery and veins
A. peronæa et Vv. peronææ
Flexor longus hallucis muscle (incised longitudinally, the segments being drawn apart)
M. flexor hallucis longus
Flexor longus hallucis muscle
M. flexor hallucis longus
Communicating branch between the posterior tibial and the peroneal arteries and companion veins[4]
Ramus communicans inter arteriam tibialem posteriorem et arteriam peronæam et venæ comitantes
Flexor longus hallucis muscle
M. flexor hallucis longus
Peroneal artery and veins
A. peronæa et Vv. peronææ
Tendo Achillis
Tendo calcaneus (Achillis)
Flexor longus digitorum pedis muscle
M. flexor digitorum longus
Tibialis posticus muscle
M. tibialis posterior
Posterior external malleolar artery and veins[2]
A. malleolaris posterior lateralis et Vv. malleolares posteriores laterales
Posterior internal malleolar artery and veins[2]
A. malleolaris posterior medialis et Vv. malleolares posteriores mediales
1/3
Internal calcaneal branches and companion veins[3]
Rami calcanei mediales et venæ comitantes
External calcaneal branches and companion veins[3]
Rami calcanei laterales et venæ comitantes
Calcaneal venous rete
Rete venosum calcaneum

[1] See Appendix, note 232. [2] See Appendix, note 236. [3] See Appendix, note 242. [4] See Appendix, note 247.

FIG. 1105.—THE HAMSTRING MUSCLES AND THE PROXIMAL EXTREMITIES (INNER AND OUTER) OF THE GASTROCNEMIUS MUSCLE WERE DRAWN APART, THE TENDO ACHILLIS WAS CUT ACROSS TRANSVERSELY A LITTLE ABOVE THE TUBEROSITY OF THE CALCANEUM, THE SOLEUS MUSCLE WAS DETACHED FROM THE TIBIA AND WAS DRAWN OUTWARDS WITH THE GASTROCNEMIUS MUSCLE; THE FLEXOR LONGUS HALLUCIS MUSCLE WAS INCISED LONGITUDINALLY AND THE SEGMENTS WERE DRAWN APART

Deep Veins of the Back of the Leg.


Anterior tibial artery
A. tibialis anterior
Internal or long saphenous vein
V. saphena magna
Anterior tibial veins
Venæ tibiales anteriores
Tibialis anticus muscle
M. tibialis anterior
Dorsal artery and veins of the foot[2]
A. dorsalis pedis et Vv. dorsales pedis
Dorsal venous rete of the foot
Rete venosum dorsale pedis
Extensor longus vel extensor proprius hallucis[3]
M. extensor hallucis longus
Dorsal metatarsal veins
Venæ metatarseæ dorsales
Dorsal venous arch of the foot
Arcus venosus dorsalis pedis
Common digital veins of the foot
Venæ digitales communes pedis
Dorsal digital veins of the foot
Venæ digitales pedis dorsales
3/5
*Intercapitular veins[1]
*Venæ intercapitulares

[1] The **intercapitular veins* of the foot are homologous with those of the hand. See Appendix, note 300.
[2] Often known in England by their Latin name of *dorsalis pedis artery* and *veins*.
[3] See note [2] to p. 364, in Part III.

FIG. 1106.—THE SUPERFICIAL VEINS AND THE DEEP VEINS AND ARTERIES OF THE DORSUM OF THE FOOT: THE DORSAL DIGITAL VEINS OF THE FOOT, VENÆ DIGITALES PEDIS DORSALES, AND THE COMMON DIGITAL VEINS OF THE FOOT, VENÆ DIGITALES COMMUNES PEDIS; THE DORSAL METATARSAL VEINS, VENÆ METATARSEÆ DORSALES, AND THE *INTERCAPITULAR VEINS (OF THE FOOT), *VENÆ INTERCAPITULARES (PEDIS); THE DORSAL VENOUS ARCH OF THE FOOT, ARCUS VENOSUS DORSALIS PEDIS, AND THE DORSAL VENOUS RETE OF THE FOOT, RETE VENOSUM DORSALE PEDIS; THE CONTINUITY OF THE DORSAL VEINS OF THE FOOT, VENÆ DORSALES PEDIS, WITH THE ANTERIOR TIBIAL VEINS, VENÆ TIBIALES ANTERIORES; THE INTERNAL OR LONG SAPHENOUS VEIN, VENA SAPHENA MAGNA.

Of the muscles of the front of the leg, the tibialis anticus muscle only was retained; on the dorsum of the foot, the extensor brevis digitorum pedis muscle was removed, but the distal extremities of the tendons of the extensor longus digitorum pedis muscle were retained.

Veins of the Dorsum of the Foot.

[1] See Appendix, note 300.

[2] See Appendix, note 250.

FIG. 1107.—THE SUPERFICIAL VEINS AND THE DEEP VEINS AND ARTERIES OF THE SOLE OF THE FOOT: THE PLANTAR VENOUS RETE, RETE VENOSUM PLANTARE, AND THE CALCANEAL VENOUS RETE, RETE VENOSUM CALCANEUM; THE PLANTAR DIGITAL VEINS, VENÆ DIGITALES PLANTARES, AND THE *INTERCAPITULAR VEINS (OF THE FOOT), *VENÆ INTERCAPITULARES (PEDIS); THE PLANTAR METATARSAL VEINS, VENÆ METATARSEÆ PLANTARES, AND THE PLANTAR VENOUS ARCH, ARCUS VENOSUS PLANTARIS; THE CONTINUITY OF THE INTERNAL AND EXTERNAL PLANTAR VEINS, VENÆ PLANTARES MEDIALIS ET LATERALIS, WITH THE POSTERIOR TIBIAL VEINS, VENÆ TIBIALES POSTERIORES; THE PLANTAR RADICLES OF THE INTERNAL OR LONG AND THE EXTERNAL OR SHORT SAPHENOUS VEINS, VENÆ SAPHENÆ, MAGNA ET PARVA.

The muscles of the sole of the foot were entirely removed, the superficial and deep bloodvessels being left intact.

Veins of the Sole of the Foot.

SYSTEMA LYMPHATICUM

THE LYMPHATIC SYSTEM

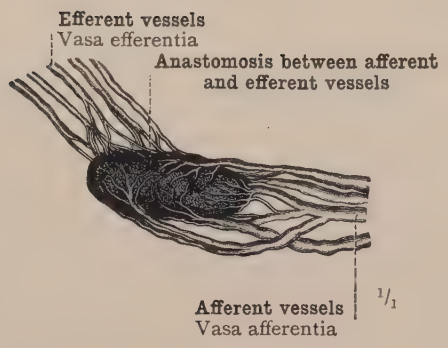


FIG. 1108.—LYMPHATIC GLAND (HUMAN) FROM THE INTERNAL ILIAC GROUP, OF WHICH THE AFFERENT AND EFFERENT VESSELS HAVE BEEN INJECTED.

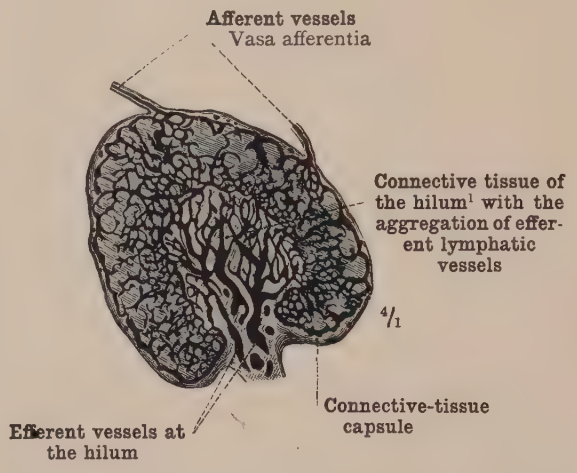

Afferent vessels
Vasa afferentia
Connective tissue of the hilum[1] with the aggregation of efferent lymphatic vessels
4/1
Connective-tissue capsule
Efferent vessels at the hilum

FIG. 1109.—TRANSVERSE SECTION THROUGH ONE OF THE INTERNAL ILIAC LYMPHATIC GLANDS OF MAN IN WHICH THE LYMPHATIC VESSELS HAVE BEEN INJECTED WITH PRUSSIAN BLUE AND THE GLAND HAS SUBSEQUENTLY BEEN HARDENED IN ALCOHOL.

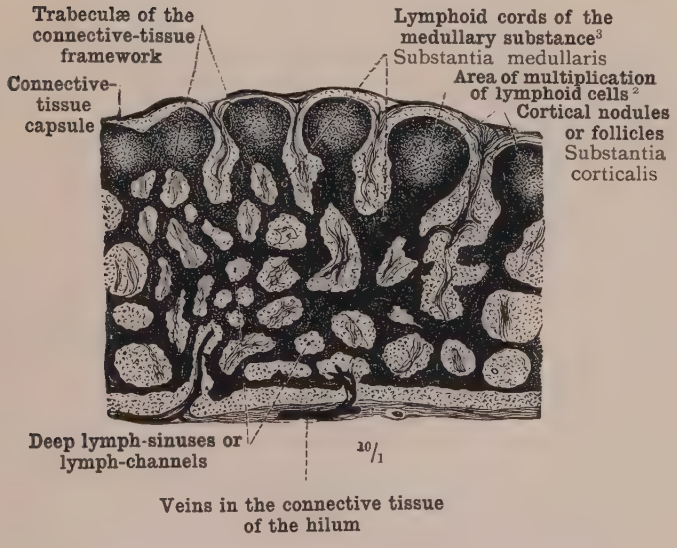

Trabeculæ of the connective-tissue framework
Lymphoid cords of the medullary substance[3]
Substantia medullaris
Connective-tissue capsule
Area of multiplication of lymphoid cells[2]
Cortical nodules or follicles
Substantia corticalis
Deep lymph-sinuses or lymph-channels
10/1
Veins in the connective tissue of the hilum

FIG. 1110.—SECTION OF A MESENTERIC LYMPHATIC GLAND, HARDENED IN ALCOHOL.

The bloodvessels, which were injected with Prussian blue, are tinted deep black.

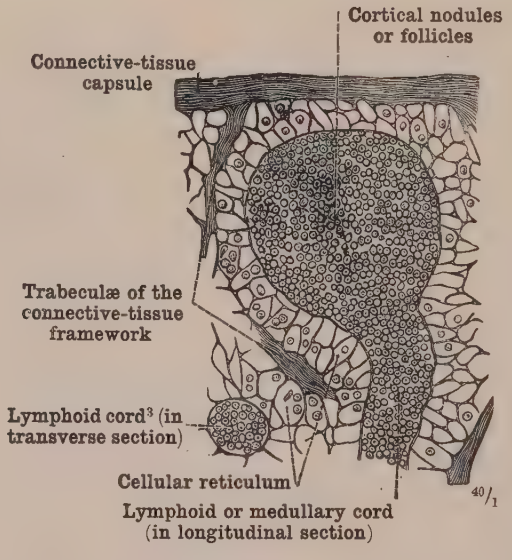
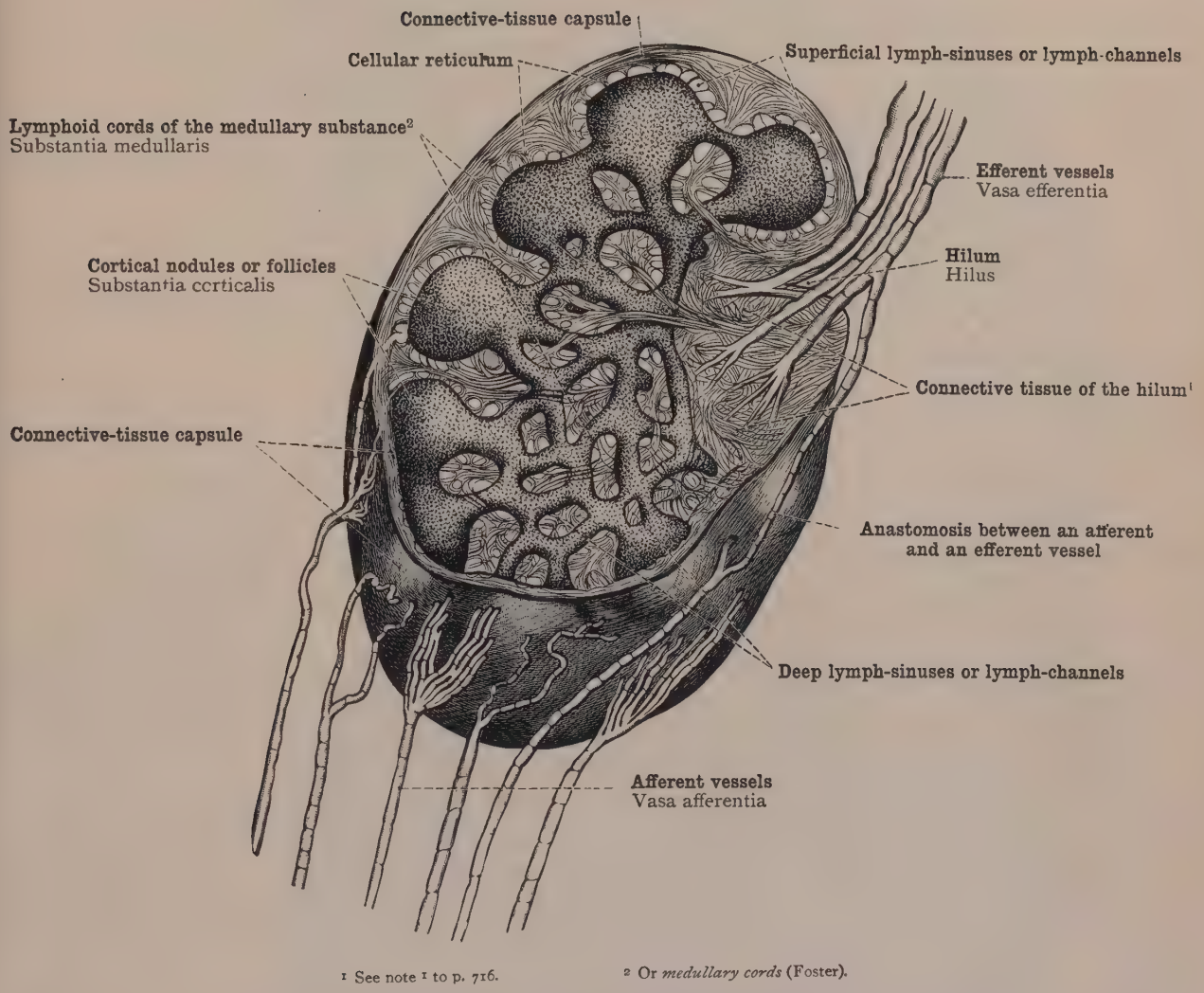


FIG. 1111.—CORTICAL NODULES OR FOLLICLES AND LYMPHOID OR MEDULLARY CORDS OF A MESENTERIC LYMPHATIC GLAND, SEEN IN TRANSVERSE SECTION, AND MAGNIFIED FORTY DIAMETERS.

[1] *Connective Tissue of the Hilum.*—"In the region of the hilum, where the efferent vessels leave the gland, the trabeculæ combine with the connective-tissue capsule to form a dense mass of connective tissue, the *Hilusstroma*, in the interior of which the radicles of the efferent lymphatic vessels are aggregated" (Von Langer and Toldt, *op. cit.*, pp. 561, 562). It is this term *Hilusstroma* which I have translated by the phrase "connective tissue of the hilum."—TR.

[2] *Keimcentrum* in the German original.

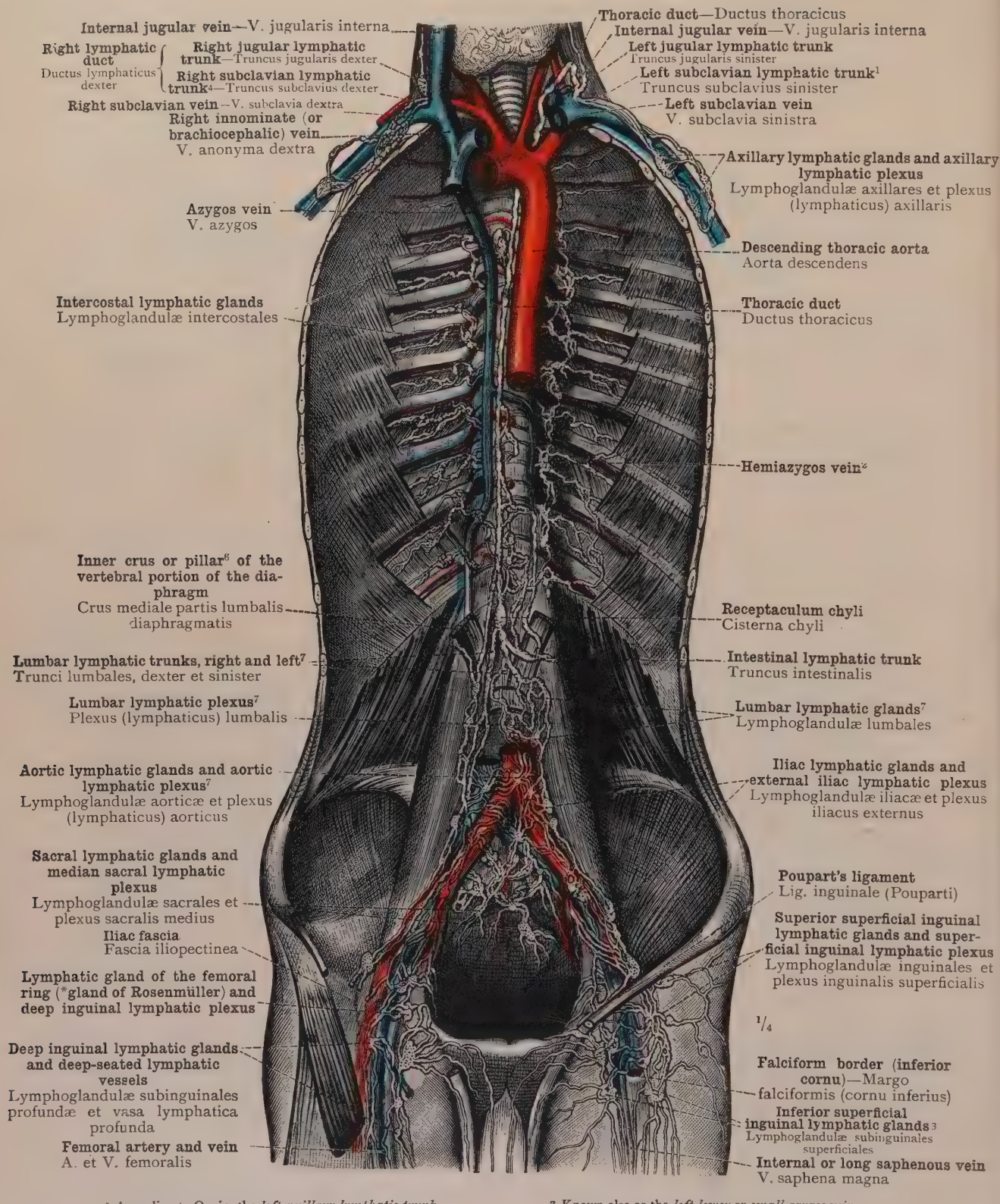
[3] Or *medullary cords* (Foster).



[1] See note [1] to p. 716. [2] Or *medullary cords* (Foster).

FIG. 1112.—DIAGRAMMATIC REPRESENTATION OF THE INTERNAL STRUCTURE OF A LYMPHATIC GLAND WITH AFFERENT AND EFFERENT LYMPHATIC VESSELS, VASA AFFERENTIA ET VASA EFFERENTIA.

Lymphoglandulæ—Lymphatic glands.


Internal jugular vein—V. jugularis interna
Right lymphatic duct
Ductus lymphaticus dexter
Right jugular lymphatic trunk—Truncus jugularis dexter
Right subclavian lymphatic trunk[4]—Truncus subclavius dexter
Right subclavian vein—V. subclavia dextra
Right innominate (or brachiocephalic) vein
V. anonyma dextra
Azygos vein
V. azygos
Intercostal lymphatic glands
Lymphoglandulæ intercostales
Inner crus or pillar[6] of the vertebral portion of the diaphragm
Crus mediale partis lumbalis diaphragmatis
Lumbar lymphatic trunks, right and left[7]
Trunci lumbales, dexter et sinister
Lumbar lymphatic plexus[7]
Plexus (lymphaticus) lumbalis
Aortic lymphatic glands and aortic lymphatic plexus[7]
Lymphoglandulæ aorticæ et plexus (lymphaticus) aorticus
Sacral lymphatic glands and median sacral lymphatic plexus
Lymphoglandulæ sacrales et plexus sacralis medius
Iliac fascia
Fascia iliopectinea
Lymphatic gland of the femoral ring (*gland of Rosenmüller) and deep inguinal lymphatic plexus
Deep inguinal lymphatic glands and deep-seated lymphatic vessels
Lymphoglandulæ subinguinales profundæ et vasa lymphatica profunda
Femoral artery and vein
A. et V. femoralis
Thoracic duct—Ductus thoracicus
Internal jugular vein—V. jugularis interna
Left jugular lymphatic trunk
Truncus jugularis sinister
Left subclavian lymphatic trunk[1]
Truncus subclavius sinister
Left subclavian vein
V. subclavia sinistra
Axillary lymphatic glands and axillary lymphatic plexus
Lymphoglandulæ axillares et plexus (lymphaticus) axillaris
Descending thoracic aorta
Aorta descendens
Thoracic duct
Ductus thoracicus
Hemiazygos vein[2]
Receptaculum chyli
Cisterna chyli
Intestinal lymphatic trunk
Truncus intestinalis
Lumbar lymphatic glands[7]
Lymphoglandulæ lumbales
Iliac lymphatic glands and external iliac lymphatic plexus
Lymphoglandulæ iliacæ et plexus iliacus externus
Poupart's ligament
Lig. inguinale (Pouparti)
Superior superficial inguinal lymphatic glands and superficial inguinal lymphatic plexus
Lymphoglandulæ inguinales et plexus inguinalis superficialis
1/4
Falciform border (inferior cornu)—Margo falciformis (cornu inferius)
Inferior superficial inguinal lymphatic glands[3]
Lymphoglandulæ subinguinales superficiales
Internal or long saphenous vein
V. saphena magna

[1] According to Quain, the *left axillary lymphatic trunk.*
[2] Known also as the *left lower* or *small azygos vein.*
[3] Often called the *femoral lymphatic glands.*
[4] According to Quain, the *right axillary lymphatic trunk.*
[5] Known also as the *right* or *large azygos vein.*
[6] See note [1] to p. 286, in Part III.
[7] See Appendix, note 314.

FIG. 1113.—THE THORACIC DUCT, DUCTUS THORACICUS, AND THE LYMPHATIC TRUNKS OPENING INTO THAT VESSEL; THE LYMPHATIC VESSELS AND LYMPHATIC GLANDS OF THE POSTERIOR WALL OF THE ABDOMEN; THE SUPERFICIAL AND DEEP LYMPHATIC VESSELS AND LYMPHATIC GLANDS OF THE GROIN.

Ductus thoracicus—The thoracic duct.

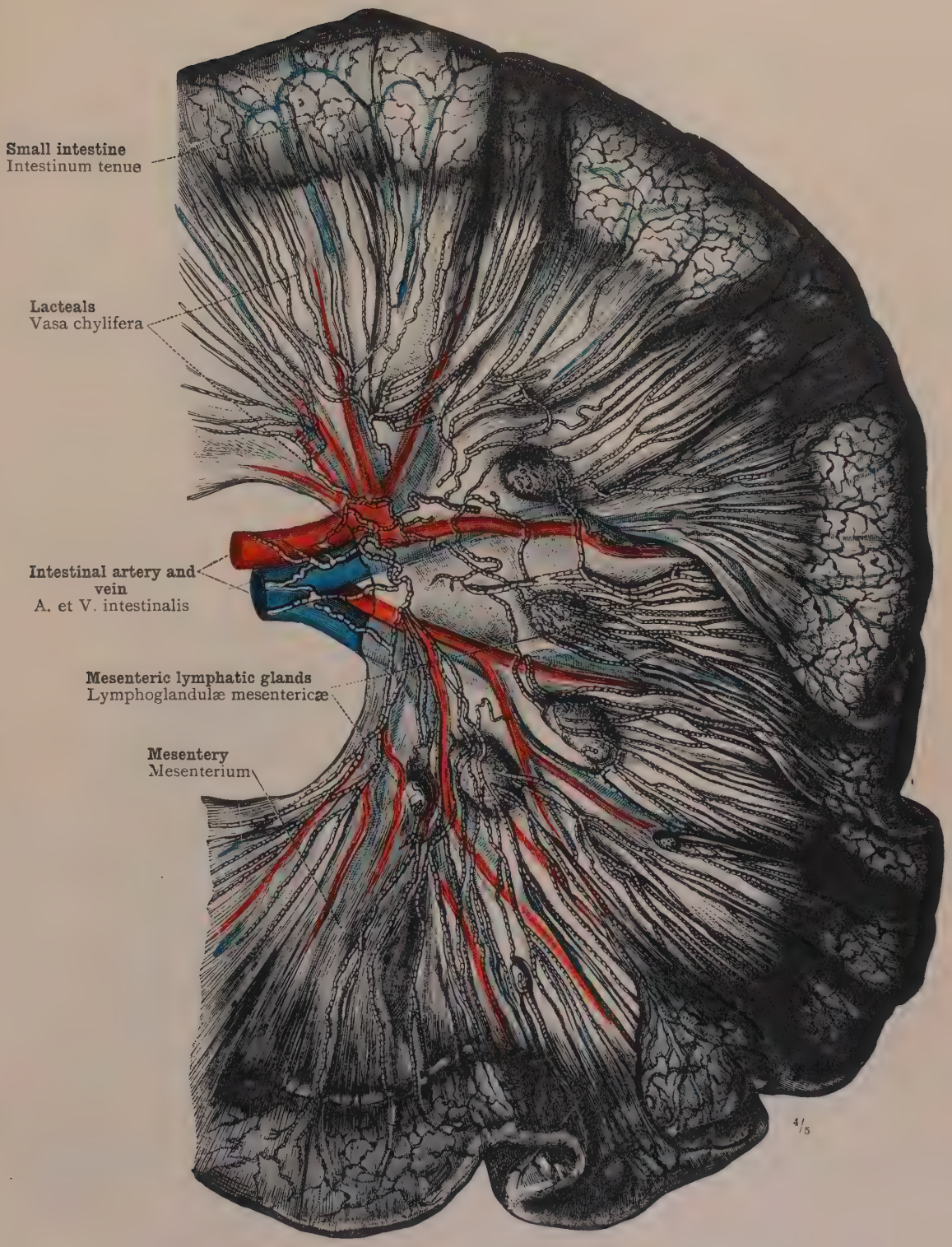
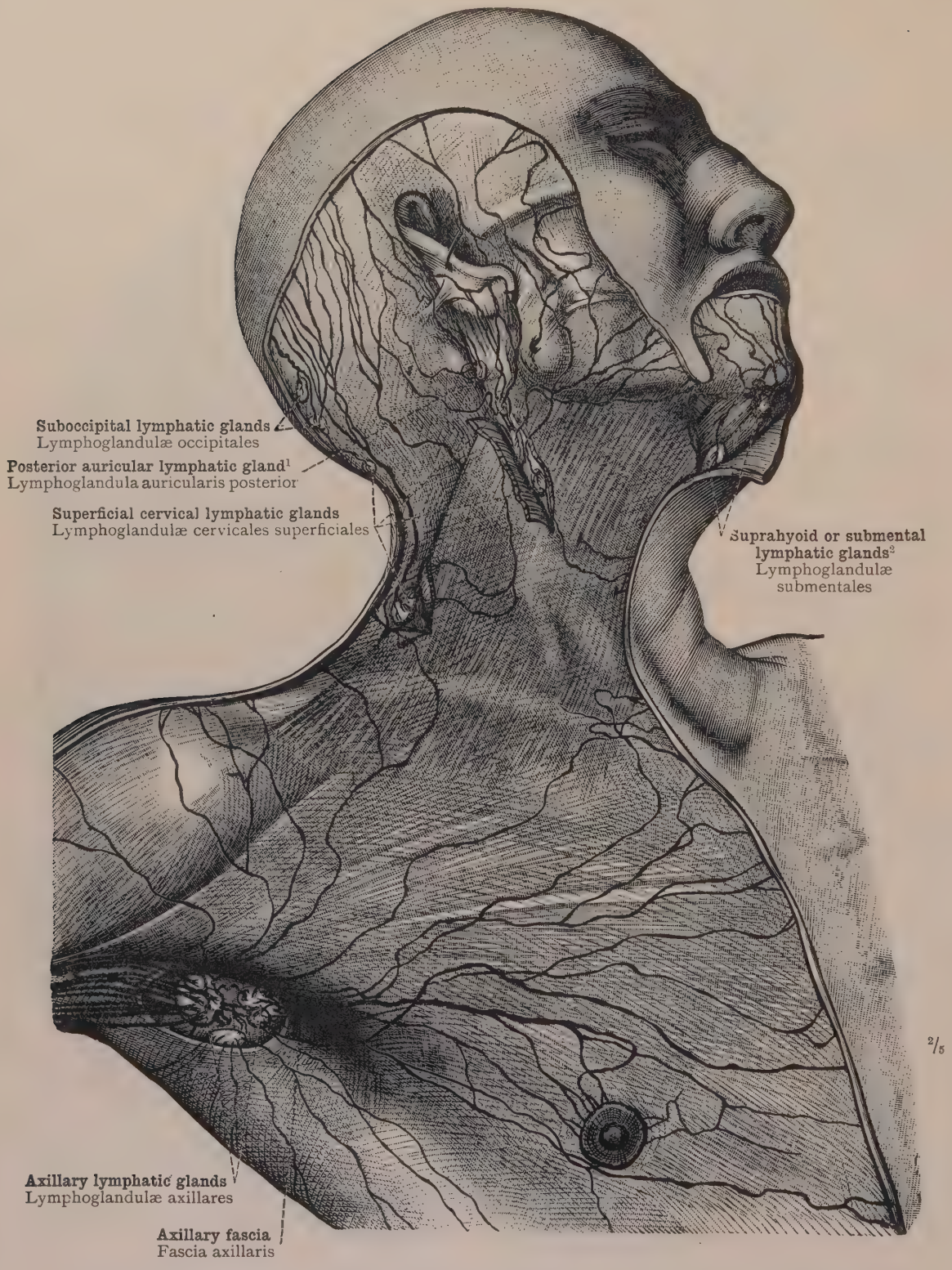


FIG. 1114.—THE LACTEALS AND THE MESENTERIC LYMPHATIC GLANDS, DEMONSTRATED IN A LOOP OF SMALL INTESTINE BY INJECTION WITH METALLIC MERCURY.

Vasa chylifera—Lacteals.—Lymphoglandulæ mesentericæ—Mesenteric lymphatic glands.

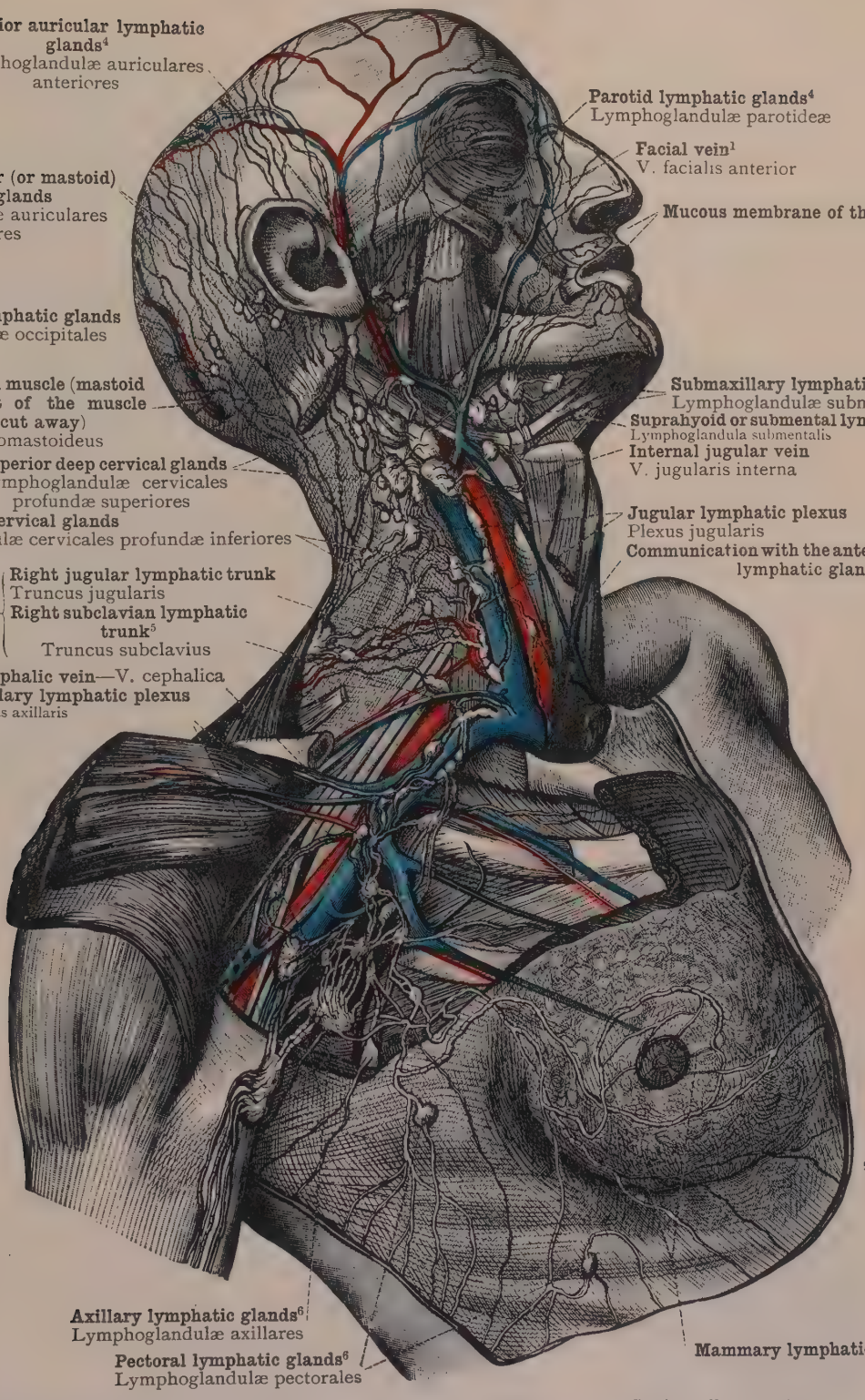


[1] This is one of the *mastoid lymphatic glands* in Quain's nomenclature.

[2] See Appendix, note 315.

FIG. 1115.—THE SUPERFICIAL LYMPHATIC VESSELS, VASA LYMPHATICA SUPERFICIALIA, OF THE HEAD AND NECK, AND OF THE UPPER THORACIC AND THE HUMERAL REGIONS, WITH THE SUPERFICIAL LYMPHATIC GLANDS WITH WHICH THEY ARE CONNECTED.

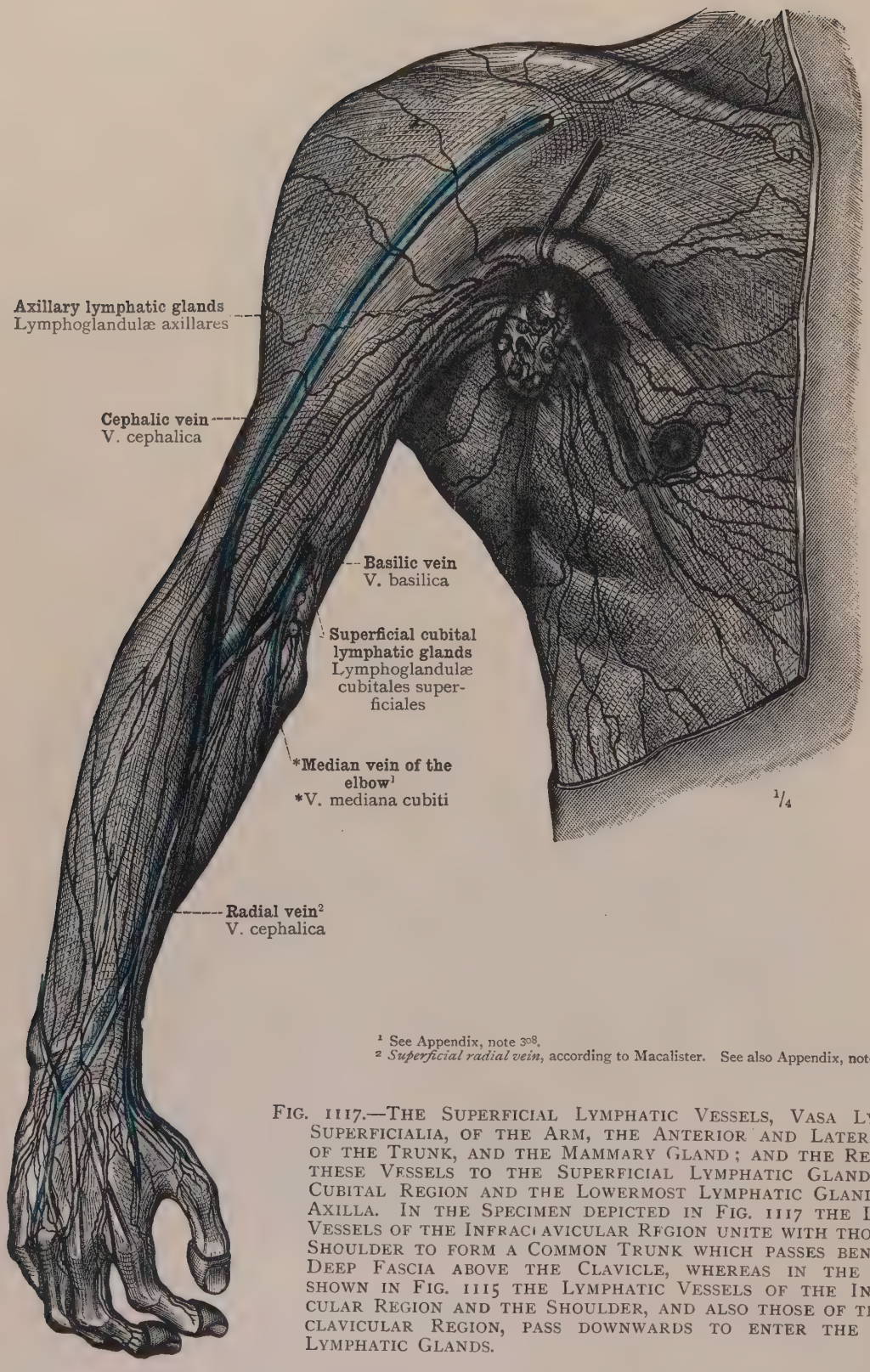
Lymphatic Vessels of the Head, the Neck, and the Anterior Wall of the Thorax.



1 Sometimes distinguished as the *anterior facial vein*. See Appendix, note 283.
2 See Appendix, note 315.
3 See Appendix, note 316.
4 See Appendix, note 317.
5 According to Quain, the *right axillary lymphatic trunk*.
6 The *pectoral*, the *subscapular*, and the *infraclavicular lymphatic glands* are described by Quain as subgroups of the *axillary lymphatic glands*.

FIG. 1116.—THE SUPERFICIAL LYMPHATIC VESSELS, VASA LYMPHATICA SUPERFICIALIA, OF THE HEAD, AND THE DEEP LYMPHATIC VESSELS, VASA LYMPHATICA PROFUNDA, OF THE NECK AND THE AXILLA, WITH THE ASSOCIATED LYMPHATIC GLANDS; THE LYMPHATIC VESSELS OF THE FEMALE MAMMARY GLAND.

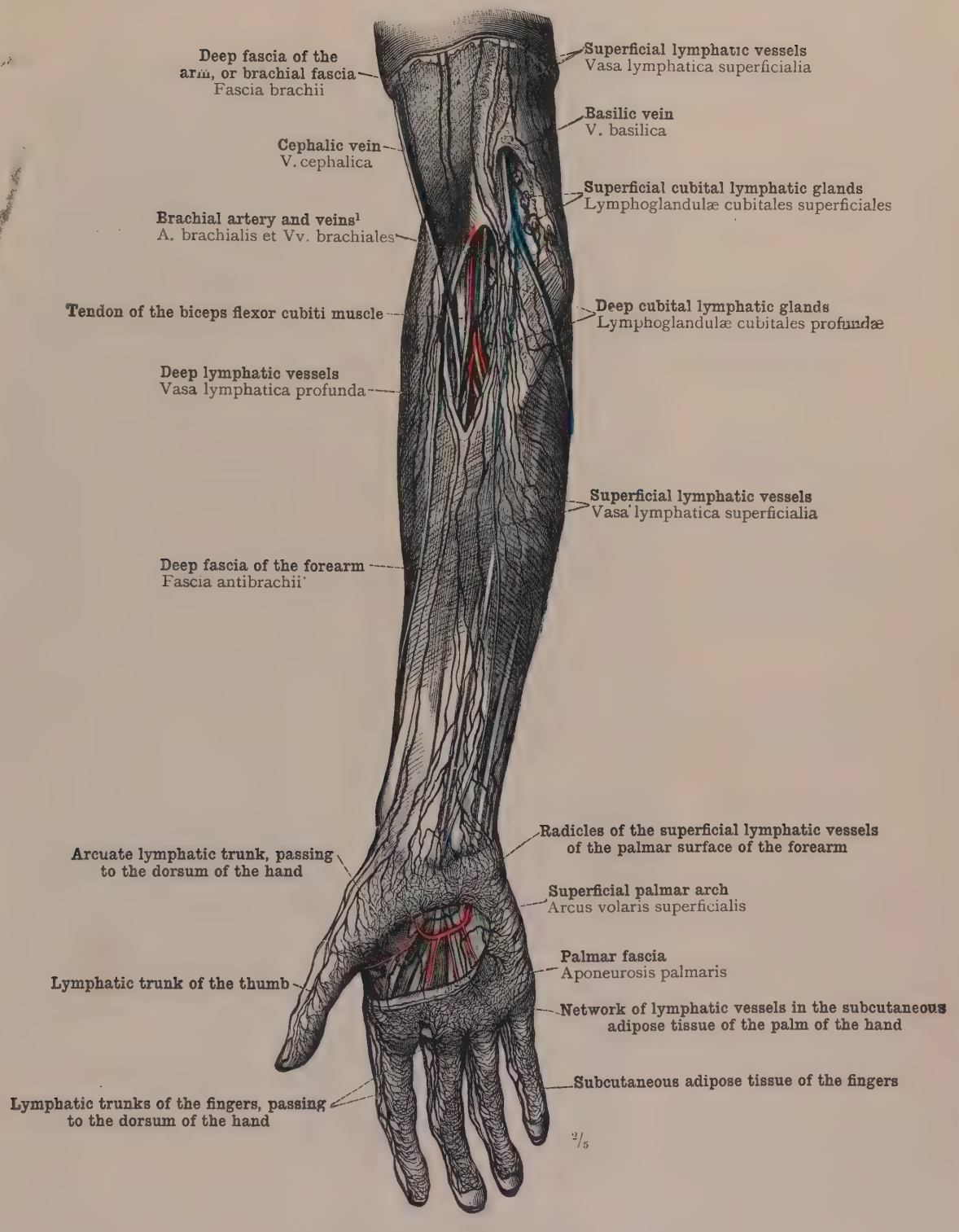
Lymphatic Vessels of the Head, the Neck, the Axilla, and the Wall of the Thorax.



[1] See Appendix, note 308.
[2] *Superficial radial vein*, according to Macalister. See also Appendix, note 305.

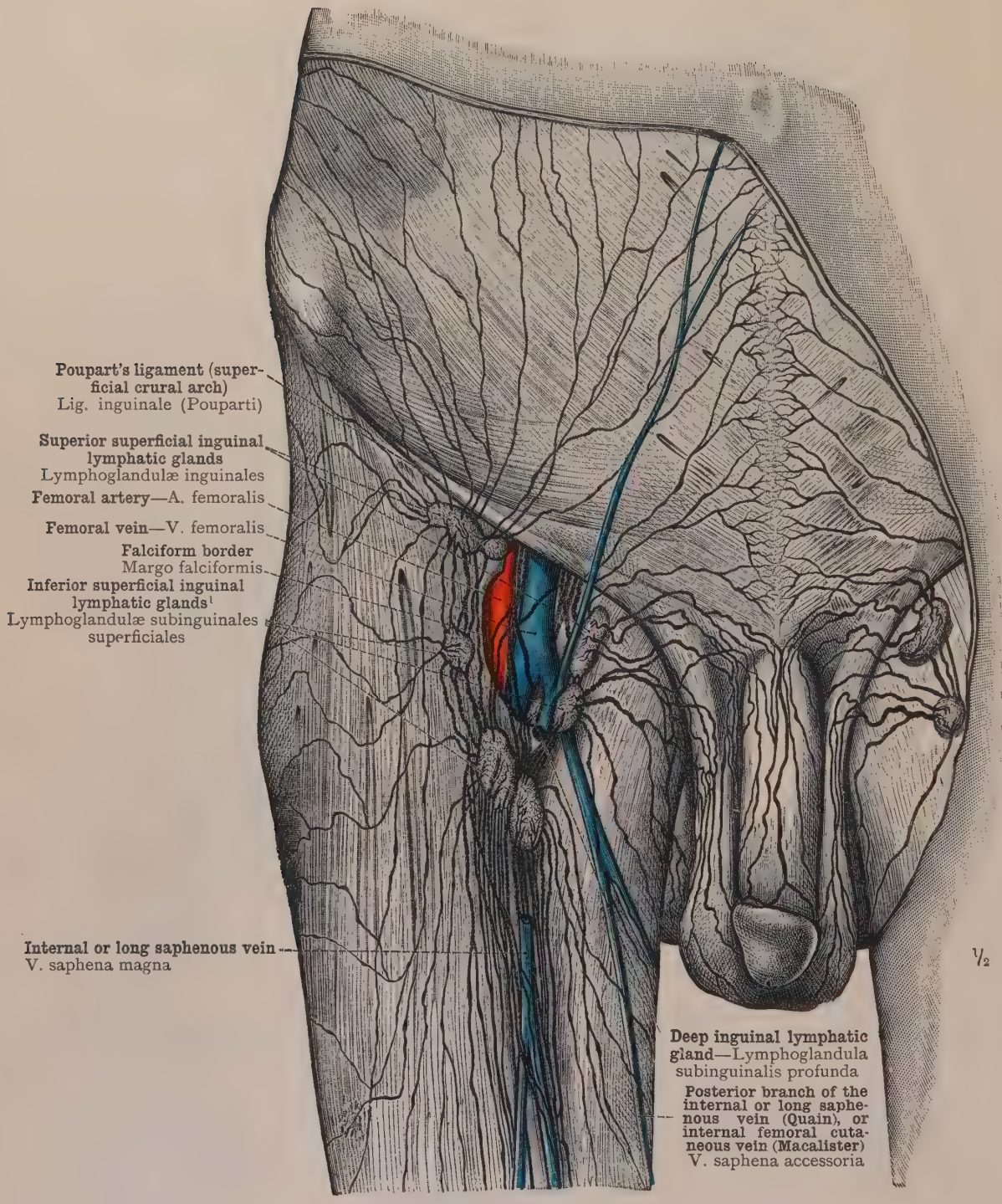
FIG. 1117.—THE SUPERFICIAL LYMPHATIC VESSELS, VASA LYMPHATICA SUPERFICIALIA, OF THE ARM, THE ANTERIOR AND LATERAL WALLS OF THE TRUNK, AND THE MAMMARY GLAND; AND THE RELATION OF THESE VESSELS TO THE SUPERFICIAL LYMPHATIC GLANDS OF THE CUBITAL REGION AND THE LOWERMOST LYMPHATIC GLANDS OF THE AXILLA. IN THE SPECIMEN DEPICTED IN FIG. 1117 THE LYMPHATIC VESSELS OF THE INFRACLAVICULAR REGION UNITE WITH THOSE OF THE SHOULDER TO FORM A COMMON TRUNK WHICH PASSES BENEATH THE DEEP FASCIA ABOVE THE CLAVICLE, WHEREAS IN THE SPECIMEN SHOWN IN FIG. 1115 THE LYMPHATIC VESSELS OF THE INFRACLAVICULAR REGION AND THE SHOULDER, AND ALSO THOSE OF THE SUPRACLAVICULAR REGION, PASS DOWNWARDS TO ENTER THE AXILLARY LYMPHATIC GLANDS.

Lymphatic Vessels of the Upper Limb and the Anterior and Lateral Walls of the Trunk.


Deep fascia of the arm, or brachial fascia
Fascia brachii
Cephalic vein
V. cephalica
Brachial artery and veins[1]
A. brachialis et Vv. brachiales
Tendon of the biceps flexor cubiti muscle
Deep lymphatic vessels
Vasa lymphatica profunda
Deep fascia of the forearm
Fascia antibrachii
Arcuate lymphatic trunk, passing to the dorsum of the hand
Lymphatic trunk of the thumb
Lymphatic trunks of the fingers, passing to the dorsum of the hand
Superficial lymphatic vessels
Vasa lymphatica superficialia
Basilic vein
V. basilica
Superficial cubital lymphatic glands
Lymphoglandulæ cubitales superficiales
Deep cubital lymphatic glands
Lymphoglandulæ cubitales profundæ
Superficial lymphatic vessels
Vasa lymphatica superficialia
Radicles of the superficial lymphatic vessels of the palmar surface of the forearm
Superficial palmar arch
Arcus volaris superficialis
Palmar fascia
Aponeurosis palmaris
Network of lymphatic vessels in the subcutaneous adipose tissue of the palm of the hand
Subcutaneous adipose tissue of the fingers
2/5

[1] Or *venæ comites of the brachial artery.*

FIG. 1118.—LYMPHATIC VESSELS OF THE PALMAR SURFACE OF THE FOREARM AND HAND. IN THE FLEXURE OF THE ELBOW (ANTECUBITAL FOSSA), THE DEEP LYMPHATIC VESSELS AND GLANDS HAVE BEEN EXPOSED BY DIVISION OF THE DEEP FASCIA.

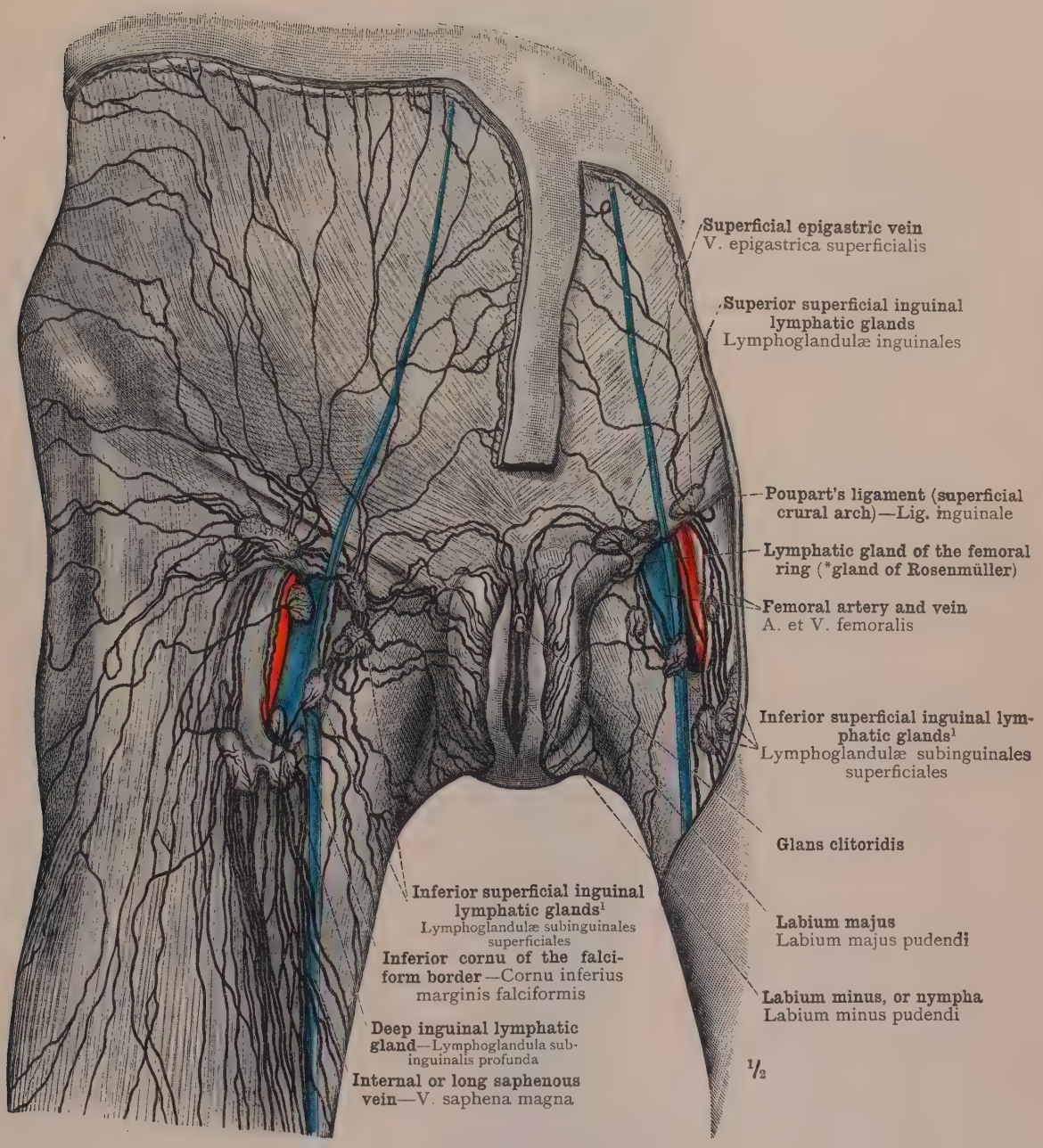

Poupart's ligament (superficial crural arch)
Lig. inguinale (Pouparti)
Superior superficial inguinal lymphatic glands
Lymphoglandulæ inguinales
Femoral artery—A. femoralis
Femoral vein—V. femoralis
Falciform border
Margo falciformis
Inferior superficial inguinal lymphatic glands[1]
Lymphoglandulæ subinguinales superficiales
Internal or long saphenous vein
V. saphena magna
Deep inguinal lymphatic gland—Lymphoglandula subinguinalis profunda
Posterior branch of the internal or long saphenous vein (Quain), or internal femoral cutaneous vein (Macalister)
V. saphena accessoria
½

[1] Often called the *femoral lymphatic glands.*

FIG. 1119.—THE SUPERFICIAL LYMPHATIC VESSELS, VASA LYMPHATICA SUPERFICIALIA, OF THE INGUINAL REGION, THE MALE EXTERNAL GENITAL ORGANS, AND THE ADJOINING PORTIONS OF THE THIGH AND ABDOMEN, WITH THE ASSOCIATED LYMPHATIC GLANDS; THE SUPERFICIAL INGUINAL LYMPHATIC PLEXUS.

The superior cornu of the falciform border and part of the internal or long saphenous vein were removed.

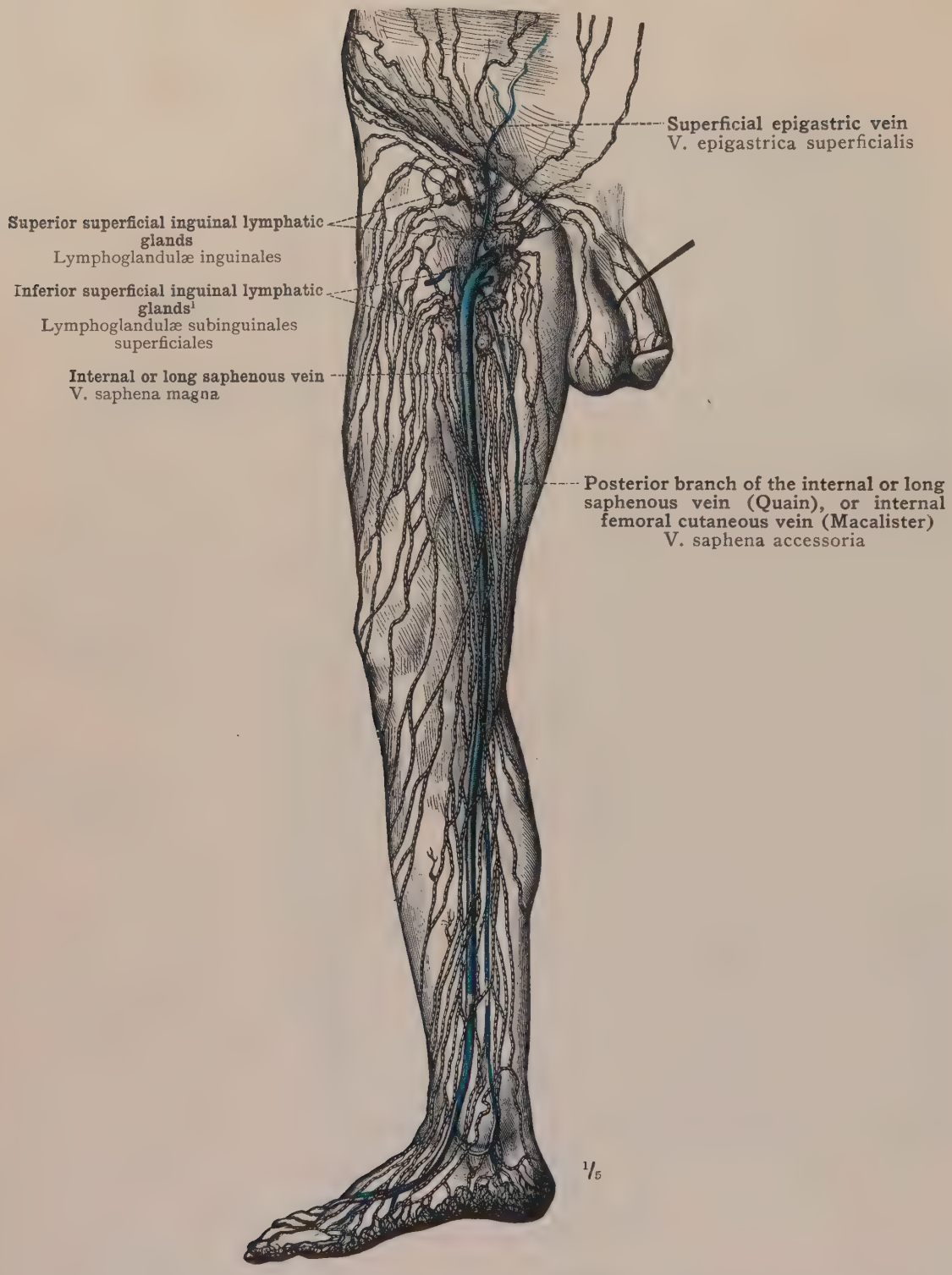
Superficial Lymphatic Vessels and Glands of the Inguinal Region and the Male External Genital Organs.


Superficial epigastric vein
V. epigastrica superficialis
Superior superficial inguinal lymphatic glands
Lymphoglandulæ inguinales
Poupart's ligament (superficial crural arch)—Lig. inguinale
Lymphatic gland of the femoral ring (*gland of Rosenmüller)
Femoral artery and vein
A. et V. femoralis
Inferior superficial inguinal lymphatic glands[1]
Lymphoglandulæ subinguinales superficiales
Glans clitoridis
Labium majus
Labium majus pudendi
Labium minus, or nympha
Labium minus pudendi
Inferior superficial inguinal lymphatic glands[1]
Lymphoglandulæ subinguinales superficiales
Inferior cornu of the falciform border—Cornu inferius marginis falciformis
Deep inguinal lymphatic gland—Lymphoglandula subinguinalis profunda
Internal or long saphenous vein—V. saphena magna
1/2

[1] Often called the *femoral lymphatic glands.*

FIG. 1120.—THE SUPERFICIAL LYMPHATIC VESSELS, VASA LYMPHATICA SUPERFICIALIA, OF THE INGUINAL REGION, THE FEMALE EXTERNAL GENITAL ORGANS, AND THE ADJOINING PORTIONS OF THE THIGH AND ABDOMEN, WITH THE ASSOCIATED LYMPHATIC GLANDS.

Superficial Lymphatic Vessels and Glands of the Inguinal Region and the Female External Genital Organs.


Superficial epigastric vein
V. epigastrica superficialis
Superior superficial inguinal lymphatic glands
Lymphoglandulæ inguinales
Inferior superficial inguinal lymphatic glands[1]
Lymphoglandulæ subinguinales superficiales
Internal or long saphenous vein
V. saphena magna
Posterior branch of the internal or long saphenous vein (Quain), or internal femoral cutaneous vein (Macalister)
V. saphena accessoria
1/5

[1] Often called the *femoral lymphatic glands.*

FIG. 1121.—THE SUPERFICIAL LYMPHATIC VESSELS, VASA LYMPHATICA SUPERFICIALIA, OF THE RIGHT LOWER LIMB, THE MALE EXTERNAL GENITAL ORGANS, AND THE ANTERIOR WALL OF THE ABDOMEN, WITH THE SUPERIOR SUPERFICIAL INGUINAL LYMPHATIC GLANDS, LYMPHOGLANDULÆ INGUINALES, AND THE INFERIOR SUPERFICIAL INGUINAL LYMPHATIC GLANDS (OFTEN CALLED THE FEMORAL LYMPHATIC GLANDS), LYMPHORLANDULÆ SUBINGUINALES SUPERFICIALES. SEEN FROM BEFORE AND THE INNER SIDE.

The lymphatic vessels were injected with metallic mercury.

Lymphatic Vessels of the Lower Limb.

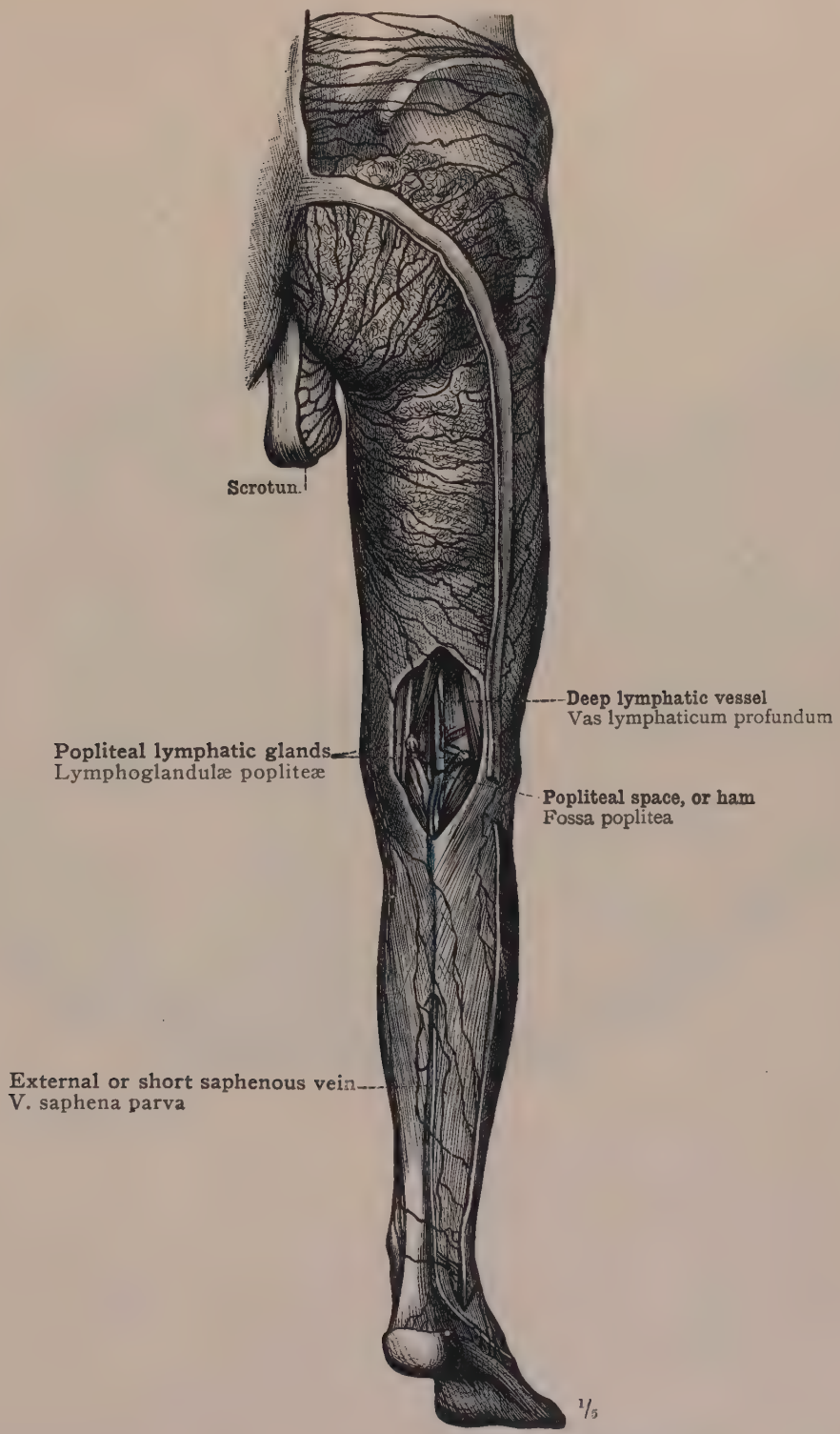
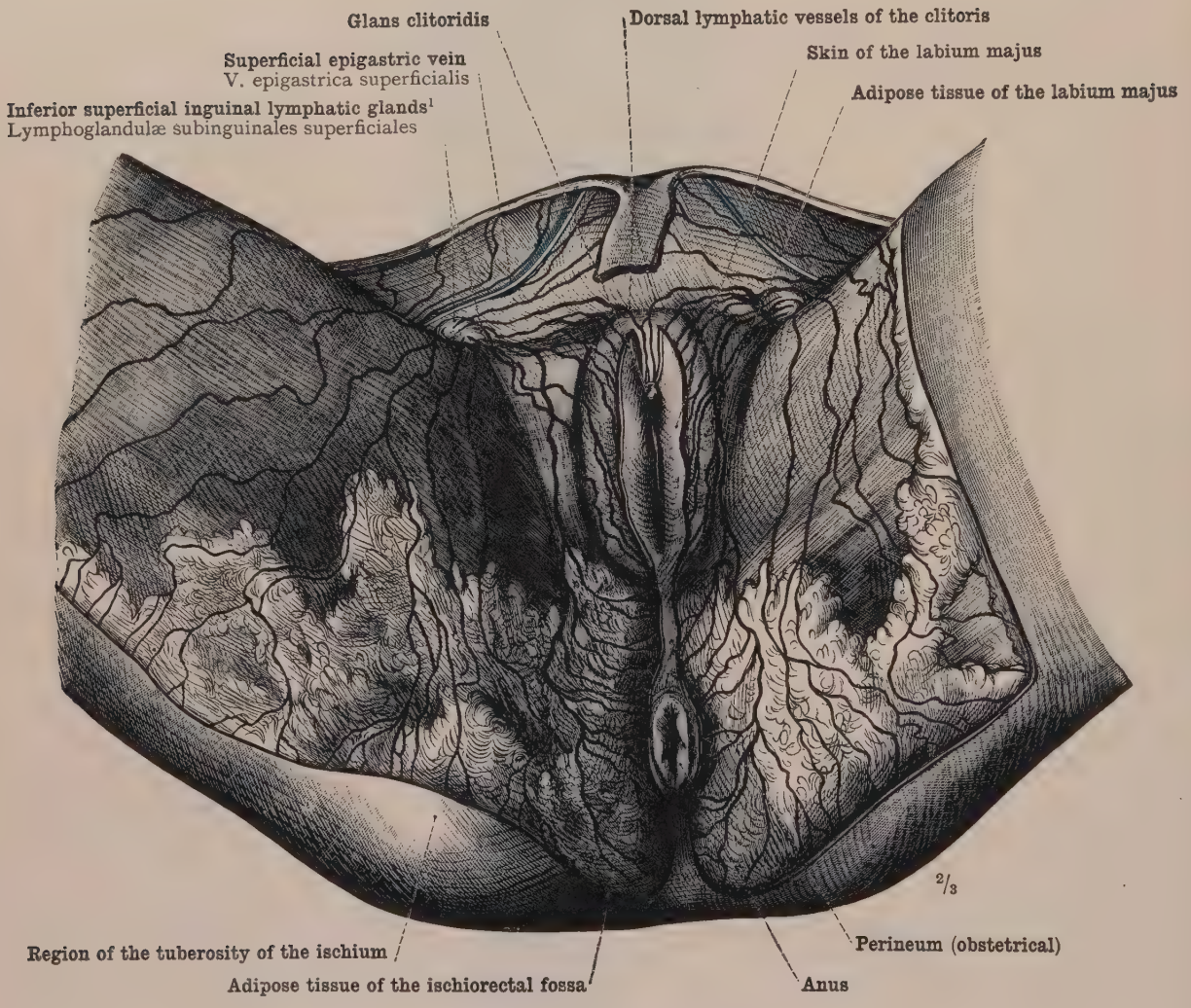


FIG. 1122.—THE SUPERFICIAL LYMPHATIC VESSELS VASA LYMPHATICA SUPERFICIALIA, OF THE BACK OF THE RIGHT LOWER LIMB, THE HIP AND THE SCROTUM. IN THE POPLITEAL SPACE, OR HAM, THE DEEP LYMPHATIC VESSELS AND GLANDS HAVE BEEN EXPOSED BY DIVISION OF THE DEEP FASCIA.

Lymphatic Vessels of the Lower Limb.



[1] Often called the *femoral lymphatic glands.*

FIG. 1123.—THE SUPERFICIAL LYMPHATIC VESSELS, VASA LYMPHATICA SUPERFICIALIA, OF THE PERINEAL REGION AND THE FEMALE EXTERNAL GENITAL ORGANS.

In order to expose the dorsal lymphatic vessels of the clitoris (both in this specimen and in that depicted in Fig. 1120), the anterior commissure of the vulva was divided and the prepuce of the clitoris removed, so as to lay bare the body of that organ.

Superficial Lymphatic Vessels of the Perineal Region.

APPENDIX TO PART V.

NOTES BY TRANSLATOR

[111] (Fig. 944, p. 562.) The *ligamentum arteriosum* is a fibrous cord passing from the upper aspect of the right pulmonary artery, a little to the left of the bifurcation of the main trunk, upwards and backwards to the under side of the arch of the aorta. It is the remains of the obliterated fœtal *ductus arteriosus*. These structures are sometimes called the *ligament* and *duct of Botallo* (*Botallus*).

[112] *Sinuses of Valsalva* (Ibid.).—The pulmonary artery, like the aorta, exhibits three bulgings at its root, opposite the three *semilunar* or *sigmoid* flaps of the valve guarding its ventricular orifice, known as the *sinuses of Valsalva*. The capacity of these sinuses is greater in the case of the aorta than in the case of the pulmonary artery, and it is the aortic sinuses that are as a rule denoted when the sinuses of Valsalva are spoken of without further qualification. Macalister, indeed, uses the name *sinuses of Valsalva* only in reference to the aorta, and terms the similar structures in the pulmonary artery the *pulmonary sinuses*. Young, on the other hand, in his "Synopsis of Human Anatomy" (U.S.), denotes by the term *sinuses of Valsalva* the *pulmonary sinuses* only, and states that "the *sinus aortici* correspond to the sinuses of Valsalva on the right side;" but this is opposed to the customary usage.

[113] *Auricle and Atrium* (Ibid.).—The name *auricle* (*auricula*, little ear) was originally applied to what in England is now called the *auricular appendix*, which has a triangular pointed shape resembling that of the external ear of many mammals. The antechambers of the heart as a whole were called the *atria*. In Germany these terms are still used in their primitive signification; but in England the term *auricle* has, by metonymy, come to denote the antechamber as a whole, each *auricle* consisting of two parts: the *atrium* and the *auricular appendix*.

[114] *Arteria Coronaria* (*Cordis*) *Dextra* (Ibid.).—The word *cordis* is added to distinguish the coronary arteries of the heart from the coronary arteries of the lips and the stomach respectively. In the author's nomenclature, however, the distinction is superfluous, since the *coronary arteries of the lips* are by him named *arteriæ labiales;* and the *coronary artery of the stomach, arteria gastrica sinistra*. Usually, moreover, the context is sufficient guide, and the qualification unnecessary. The branches of the *right coronary artery* seen in this figure are the smaller *infundibular* branch, which ramifies over the conus anteriosus of the right ventricle; and the larger *marginal* branch, which runs down the right border to the apex of the heart. (Macalister calls these the *preventricular* and *right marginal* arteries, respectively.) The *smallest cardiac veins* correspond to the former branch, the *anterior cardiac veins* to the latter. The termination of the right coronary artery in *transverse* and *descending* branches is seen in the next figure.

[115] *Sinus Venosus and Sulcus Terminalis* (Fig. 945, p. 563).—Quain ("Anatomy," 10th ed., vol. ii., part ii., pp. 356 and 357) writes: "The main part of the auricle, that into which the great veins directly pour their blood, is commonly named *sinus venosus*, or *atrium*, to distinguish it from the auricular appendix. At the outer and posterior part of the atrium is a slight groove, the *sulcus terminalis* of His, which runs from the front of the termination of the superior to the right of the inferior vena cava, and marks off the portion of the atrium formed by the dilated end of the venous trunks (*saccus reuniens* of the embryo) from that belonging to the primitive auricle." While Quain thus identifies the *sinus venosus* with the main cavity of the right auricle, Toldt denotes by the *sinus venarum* (*cavarum*) only that portion of the cavity lying to the left of the sulcus terminalis; the meaning of the English equivalent, *sinus venosus*, should be similarly restricted, as it then denotes that portion of the cavity of the auricle corresponding to the *saccus reuniens* of the embryo.

[116] (Ibid.) The *right coronary artery* is here seen dividing into its terminal *transverse* and *descending* branches. The latter is called by Macalister the *posterior interventricular* artery. For the earlier branches of the right coronary artery, see above, note [114].

[117] (Ibid.) The *oblique vein of Marshall* runs from the *vestigial fold* (*plica venæ cavæ sinistræ*—see Fig. 974, p. 584) over the back of the left auricle to join the coronary sinus. It has no valve over its orifice; and the vein, together with the coronary sinus, is regarded as the vestige of the left superior vena cava of the fœtus (see note [122] below).

[118] **Corona Cordis* (Ibid.).—The author describes the heart as divided by the auriculoventricular groove into two parts: the *Herzkrone* (*corona cordis*), consisting of the two auricles with the intrapericardial portions of the great vessels; and the *Herzkegel* ("cone of the heart"—no Latin equivalent is given), consisting of the two ventricles. No English equivalent for these terms is used by Quain or Macalister, the *base of the heart* being not a portion, but one of the surfaces of the organ.

[119] **Umbilical Ring* (Fig. 970, p. 580).—"The small aperture in the anterior abdominal wall by means of which the umbilical vessels pass into the umbilical cord, *annulus umbilicalis*, closes during the days immediately following birth" (Von Langer and Toldt, *op. cit.*, p. 406). In England the term *umbilical ring* is seldom employed, the term *umbilicus* denoting that structure as well as the *navel proper*, the permanent remnant of the umbilical cicatrization. The author's terminology, however, is more accurate.

[120] *Hypogastric Artery* (Ibid.).—In England this term denotes the intra-abdominal portion of the umbilical artery of the fœtus, which undergoes obliteration after the cessation of the placental circulation, and is represented in the adult by a fibrous cord. The author's *arteria hypogastrica* and *vena hypogastrica*, on the other hand, denote the *internal iliac artery* and *vein* of English anatomists.

[121] *Bulbus Venæ Jugularis* (Fig. 972, p. 582).—The author recognises *two bulbs* of the internal jugular vein, a *superior* and an *inferior*. English anatomists, when speaking of the *bulb* or *sinus of the internal jugular vein*, denote the *bulbus superior* of Toldt, only. This dilatation occupies the large posterior compartment of the

jugular foramen (see Fig. 1080, p. 685). According to Langer, however, the bulb does not belong to the internal jugular vein, but is to be regarded as the convexity of a sharp bend formed by the lateral sinus before it terminates in the vein. The *bulbus venæ jugularis inferior* of Toldt is the dilated inferior extremity of the internal jugular vein, just above its junction with the subclavian vein.

[122] *Plica Venæ Cavæ Sinistræ* (Fig. 974, p. 584).—This is a fold of pericardium, called by Marshall the *vestigial fold*, lying between the left pulmonary artery and the subjacent pulmonary vein. It encloses a vestige of the left superior vena cava (*duct of Cuvier*) of the fœtus in the form of a strand of fibrous tissue. From its inferior extremity the *oblique vein of Marshall* runs across the back of the left auricle to open into the coronary sinus. See note [117] above.

[123] **Jugular Venous Arch* (Ibid.).—This term is not used by Quain or Macalister. It is applied by the author to the *communicating branch* in the *suprasternal space* (*Burns's space*) between the two *anterior jugular veins*, and to those portions of the *anterior jugular veins* below the *communicating branch* which run outwards on each side behind the origin of the sternocleidomastoid muscle to open into the lower end of the *external jugular vein*. A transverse venous arch is thus formed at the root of the neck between the *external jugular veins*.

[124] (Fig. 975, p. 585).—In the normal development of the great veins, it is this communicating branch, often called the *transverse jugular vein*, which forms the greater part of the definitive left innominate vein.

[125] *Angulus Venosus* (Ibid.).—The name **venous angle, right*, and *left*, is given by the author to the junction on the respective sides of the neck of the internal jugular and subclavian veins, normally to form the innominate veins; in the specimen shown in Fig. 975, however, to form the superior vena cava (right and left).

[126] *Lumbar Arteries* (Fig. 981, p. 592).—These are usually five in number on each side, of which the upper four regularly arise from the aorta, and sometimes the fifth also; but quite often this artery, *arteria lumbalis ima*—the *lowest lumbar artery*—is, as in the present specimen, a branch of the *middle sacral artery*, or *sacral aorta*.

[127] (Ibid.) The *middle sacral artery* represents the caudal prolongation of the aorta met with in lower mammals, and its lateral branches are homologous with the intercostal and lumbar arteries; hence the name *sacral aorta*, used by Macalister. According to the terminology of this author (*op. cit.*, p. 428), "At the sacrococcygeal joint the artery becomes *middle coccygeal* or *caudal*, and is continued downwards to the tip of the coccyx, where its terminal branch passes outwards to end in the coccygeal glomerulus." In Toldt's nomenclature, however, as in that of Quain, the *middle sacral artery* (*arteria sacralis media*) retains its name unchanged up to its termination in the *coccygeal gland* or *glomerulus* (*glomus coccygeum*). This structure is shown in Fig. 926, p. 534, Part IV.

[128] *Sinus Maximus Aortæ* (Ibid.).—The space between the dotted lines pointing to the *ascending aorta* and the *arch of the aorta* in Fig. 981 is occupied by the *great sinus of the aorta*, which is not mentioned by the author. The aorta is first of a trefoil shape, owing to the presence of the *sinuses of Valsalva*, then becomes circular, then elliptical, the upper part of the ascending aorta and the commencement of the arch being dilated to form the *great sinus*, the long axis of whose ellipse is directed backwards and to the left. The dilatation varies in size in different bodies, is usually better marked in elderly persons, and occasionally is not to be detected. Before the *aortic isthmus*, the lumen of the tube again becomes circular. See also Fig. 951, p. 569.

[129] *Spermatic Artery* (Ibid.).—This artery is called by the author *arteria spermatica interna*, to distinguish it from the *arteria spermatica externa*—the *cremasteric artery* of English anatomists.

[130] *Arteria Hepatica Propria* (Fig. 983, p. 594).—According to the author's nomenclature, the hepatic artery breaks up into a *descending* division, *arteria gastroduodenalis*, and an *ascending* division, *arteria hepatica propria*. The latter gives off the *arteria gastrica dextra* (pyloric artery), and then breaks up into a *ramus sinister* and *ramus dexter* (the left and right hepatic arteries). The term *arteria hepatica propria* has no English equivalent, the artery, from its origin from the cœliac axis to its division into right and left hepatic arteries, being called simply the *hepatic artery*.

[131] *Pyloric Artery* (Ibid.).—This, the *arteria gastrica dextra* of the author, is called by Macalister the *superior pyloric artery*, to distinguish it from a small branch, usually unnamed, of the *gastroduodenal artery*, but called by him the *inferior pyloric artery*.

[132] *Ramus Costalis Lateralis* (Fig. 988, p. 599).—"Among the branches of the internal mammary artery, a not unimportant and somewhat common variety is the existence of the *ramus costalis lateralis*; this arises just above the first rib from the internal mammary trunk, runs obliquely downwards and backwards on the inner surface of the wall of the thorax as far as the fifth or sixth rib, and gives offsets in the intercostal spaces which anastomose with branches of the intercostal arteries" (Von Langer and Toldt's "Anatomy," p. 513). Quain (*op. cit.*, vol. ii., p. 429) calls this the *lateral* branch of the internal mammary artery, and states that when present it runs "about midway between the spine and sternum, or somewhat further forward." Macalister calls it the *lateral infracostal* branch, and remarks: "The existence of this vessel must be remembered in paracentesis. I have seen it of enormous size in cases of obliteration of the dorsal aorta from the pressure of an intrathoracic tumour" ("Anatomy," p. 554).

[133] *Inner Mammary Branches* (Ibid.).—"The perforating branches (of the internal mammary artery) of the third, fourth, and fifth spaces in the female give *rami mammarii* to the breast" (Von Langer and Toldt, *op. cit.*, p. 513). In Fig. 988, it is the *anterior perforating branch* of the *second* right space that furnishes the largest of these *mammary branches*.

[134] (Ibid.) *The origin of the branches of the subclavian artery* is so variable that it is difficult to decide which arrangement is to be regarded as normal. Von Langer and Toldt describe the *thyroid axis* as supplying four branches: the *inferior thyroid*, the *ascending cervical*, the *superficial cervical*, and the *suprascapular*. Quain states that the *thyroid axis* divides into "the *inferior* or *ascending thyroid*, the *suprascapular*, and a third branch, which is either the *transverse cervical*, or one of the branches into which that artery, when present, divides—viz., the *superficial cervical*" (the other being the *posterior scapular*). Here, however, we see a trunk, called by Toldt the *superficial cervical*, dividing into the *transverse cervical* and (presumably) the *posterior scapular*. Macalister uses the name *posterior scapular* as synonymous with *transverse cervical*, and regards the common origin of the *superficial cervical* and the *posterior scapular* as one of the most frequent arrangements. (See also note [135] below.)

[135] (Ibid.) According to Quain's nomenclature, this trunk would be called the *transverse cervical*, while of the two branches into which it divides, the lower, called here *transversa colli*, is the *superficial cervical*, the upper, apparently, the *posterior scapular*. (See also note [134] above and notes [172] and [208] below.)

[136] (Ibid.) According to the usual English nomenclature, this

artery is still known as the *subscapular* after the *dorsal scapular* branch has been given off. Macalister, however, follows the Continental usage in calling it the *thoracicodorsalis artery*. (See note [203] below.)

[137] *Outer Mammary Branches* (Ibid.).—Those shown here are the *anterior divisions* of the *lateral cutaneous* (*pectoral*) *branches* of the *intercostal arteries*. (For the origin of these branches, see Fig. 978, p. 589.) Other *outer mammary branches* are normally supplied by the *long thoracic artery* (see Fig. 1017, p. 628), which for this reason is sometimes called the *external mammary artery*.

[138] *Scrotal and Labial* (*or Vulval*) *Arteries, Anterior and Posterior* (Ibid.).—As these names are not employed by Quain or Macalister, some explanation is required of the manner in which they are applied by the author. The *superficial* or *long perineal artery* (see notes [147] and [149] below) terminates by dividing in the anterior half of the perineum (in the triangular intermuscular space beneath Colles's fascia) by dividing into two long slender branches which proceed forwards as the *arteriæ scrotales posteriores*, in the male, to supply the posterior half of the scrotum, and as the *arteriæ labiales posteriores*, in the female, to supply the hinder part of the vulva. The *superior* and *inferior external pudic arteries* (called by Macalister *superior* or *superficial pubic* and *inferior pubic*, respectively) are distributed chiefly to the front of the scrotum, in the male, and of the vulva, in the female, by means of terminal branches, *arteriæ scrotales anteriores* and *arteriæ labiales anteriores*, respectively, which anastomose with the posterior scrotal and posterior labial (or vulval) arteries just described. The arteries are accompanied by veins similarly named by Toldt, the *posterior scrotal* (or *labial*) *veins* being tributaries of the *superficial* or *long perineal vein;* and the *anterior scrotal* (or *labial*) *veins* opening into the *external pudic veins*.

[139] *Internal Pudic Artery* (Fig. 989, p. 600).—This is called by Macalister the *pudic artery* without qualification, since the small branches of the epigastric artery commonly denominated *external pudic* are by him termed the *pubic arteries* (see note [138] above).

[140] *Pelvic Diaphragm* (Ibid.).—As used by English anatomists, this denotes the *levator ani* and the *coccygeus* or *levator coccygis muscles;* the author, however, includes under this designation, in addition to the muscles themselves, the *rectal fascia* covering their upper surface (*fascia diaphragmatis pelvis superior*) and the *anal fascia* covering their lower surface (*fascia diaphragmatis pelvis inferior*). See Part IV. of this work, Fig. 881, p. 513

[141] *Arteria Penis* (Ibid.).—The name of **artery of the penis* is given by the author to the distal portion of the *internal pudic artery* of English anatomists, after it has left the ischiorectal fossa, and before it bifurcates into the *artery of the corpus cavernosum* and the *dorsal artery of the penis*. The *artery of the bulb* is derived from this portion of the trunk.

[142] *Diaphragma Urogenitale* (Ibid.). — The name of *urogenital diaphragm* is given by the author to the *triangular ligament of the urethra* of English anatomists, including the muscle contained between the two layers of that ligament—the *constrictor* or *compressor urethræ*. (See Appendix to Part IV. of this work, note [99].)

[143] *Inferior Vesical and Middle Hæmorrhoidal Arteries* (Ibid.).—Quain gives *vesicoprostatic artery* as an alternative name for the *inferior vesical artery* in the male. A slender offset is seen in Fig. 989 passing to the rectum from the lower part of this vessel, and no other branch is shown in the figure representing the *middle hæmorrhoidal* or *middle rectal artery*, which is, however, usually much larger, and may be derived either from the *inferior vesical* or from the *internal pudic artery*.

[144] *Inferior Vesical Artery* (Fig. 990, p. 601).—Quain gives *vesicoprostatic artery* as an alternative name for this artery in the male.

[145] *Alcock's Canal* (Ibid.).—In the ischiorectal fossa the internal pudic artery runs in a canal in the substance of the obturator fascia, known as *Alcock's canal*. In Fig. 990 this canal has been opened to show the artery, except for a distance of about a quarter of an inch in front. For the nomenclature of the internal pudic artery, see note [139] above.

[146] (Ibid.) Quain gives *external hæmorrhoidal* as an alternative name for this artery; Macalister calls it the *anal artery*.

[147] *Arteriæ Perinei* (Ibid.).—English anatomists usually describe two *perineal* branches of the *internal pudic artery:* the *superficial* or *long perineal artery*, which arises near the front of the ischiorectal fossa, passes either superficial to or beneath the transversus perinei (superficialis) muscle, and runs forward in the triangular intermuscular space beneath Colles's fascia, to terminate in the *posterior scrotal* or *posterior labial* branches and anastomose with the *anterior scrotal* or *labial* offsets of the external pudic branches of the femoral artery (see note [138] above); and the *transverse perineal artery*, generally arising in common with the preceding, but sometimes a distinct branch, which runs inwards towards the central point of the perineum, and supplies the parts between the anus and the bulb of the urethra. Toldt calls these two branches indifferently the *arteriæ perinei*.

[148] *Ligamentum Umbilicale Laterale* (Ibid.).—After the cessation of the placental circulation at birth, the hypogastric artery becomes impervious from the side of the bladder up to the umbilicus, and is converted into a fibrous cord. In England this is usually spoken of as the *obliterated hypogastric artery*, but the author calls it the **external umbilical ligament* (in contradistinction to the **median umbilical ligament* or *urachus*). The fold of peritoneum which covers this structure as it runs along the posterior surface of the anterior abdominal wall is called by the author *plica umbilicalis lateralis*, the *external umbilical fold;* but in England it is more often known by the name of the *hypogastric fold*. See Fig. 635, p. 386, and Fig. 636, p. 387, in Part III. of this work.

[149] **Perineal Artery* (Fig. 991, p. 602).—The short trunk called by the author *arteria perinei* is seen to divide almost immediately into a posterior branch, the *transverse perineal artery*, and an anterior branch, the *superficial* or *long perineal artery*. See note [147] above.

[150] (Ibid.) Quain gives *external hæmorrhoidal* as an alternative name for this artery; Macalister calls it the *anal artery*.

[151] (Ibid.) The *superficial layer* of the *obturator fascia* where it covers the *internal pudic artery* has been removed throughout the whole length of *Alcock's canal*. See note [145] above.

[152] *Urethral Artery* (Fig. 992, p. 603).—This may arise (as here) from the *artery of the bulb*, or separately from the trunk of the *internal pudic artery*.

[153] *M. Transversus Perinei Profundus* (Ibid.).—For the nomenclature of this muscle, see Appendix to Part IV., note [101].

[154] *Arteriæ Cruris Penis* (Ibid.).—In addition to the principal *artery of the corpus cavernosum* (*arteria profunda penis*), small offsets, usually two or three in number, pass to the crus from the trunk of the *internal pudic artery*, just behind its terminal bifurcation. These are left unnamed in most English works on anatomy, but may be called *arteries of the crus penis*.

[155] (Fig. 993, p. 604.) Just behind the *superficial* or *long perineal artery*, running transversely inwards to the space between the anus and the vaginal orifice (*i.e.*, the *obstetrical perineum*) is the *transverse perineal artery* of English anatomists. (See note [14] above.)

[156] *Arteria Clitoridis* (Ibid.).—Just as, in the male, the *internal pudic artery* of English anatomists becomes, in the author's

nomenclature, the *artery of the penis* as soon as it leaves the ischiorectal fossa (see note [141] above), so, in the female, it becomes the *artery of the clitoris*, which gives off the *artery of the bulb* (*arteria bulbi vestibuli*—see Fig. 994, p. 605, and Fig. 996, p. 607) to the vaginal bulb or bulb of the vestibule, and terminates by dividing into the *artery of the corpus cavernosum of the clitoris* (*arteria profunda clitoridis*) and the *dorsal artery of the clitoris* (*arteria dorsalis clitoridis*).

[157] *Superficial or Long Perineal Artery* (Fig. 994, p. 605).—In the female, this artery is considerably larger than in the male, as will be seen by a comparison of Fig. 994, p. 605, with Fig. 991, p. 602. The foremost of the branches indicated by the author in Fig. 994 as *arteriæ hæmorrhoidales inferiores* represents the *transverse perineal artery* of English anatomists—see notes [147] and [149] above.

[158] (Ibid.) Represented here by several twigs, instead of the single stem normally given to the anus by the internal pudic artery, and called by Macalister the *anal artery*. But see also the second sentence in note [157] above.

[159] *Bulbus Vestibuli* (Ibid.).—Regarding the nomenclature of this structure, see Appendix to Part IV., note [91].

[160] *Vaginal Arteries* (Fig. 995, p. 606).—The arrangement of these in this specimen is worthy of note. The *uterine artery*, after crossing beneath the ureter and then running parallel with it for a considerable distance, gives off two branches which pass in front and behind the ureter, respectively, and then turn upwards to unite again into a considerable branch of the *internal pudic artery*. From the two arches thus formed, numerous small offsets are given to the vagina and the lower part of the bladder. For an account of the normal arrangement of the *vaginal arteries*, see note [163] below.

[161] (Ibid.) The *left iliolumbar artery* in this specimen is very much smaller than usual, and arises from the common iliac artery, instead of, as is normally the case, from the internal iliac prior to its breaking up into anterior and posterior divisions.

[162] *Arteriæ Vesicales* (Ibid.).—The arteries called *vesical* in Fig. 995 are the terminal offsets merely, not the *vesical arteries* proper. No *superior vesical artery* is depicted in this specimen; and the *inferior vesical artery* (or *vesicovaginal artery*) is represented by the branch of the *internal pudic artery* which contributes to form the arterial arches mentioned in note [160] above.

[163] *Vaginal Arteries* (Fig. 997, p. 608).—The upper part of the vagina (with the cervix uteri) is supplied by a special branch of the *uterine artery*, and it is this branch which in the left side of Fig. 997 is by the author denominated the *vaginal artery*. The lower part of the vagina is separately supplied. In the right side of Fig. 997 the author depicts *vaginal arteries* for this region arising from the *internal pudic artery;* in Fig. 995, p. 606, a somewhat similar arrangement is shown; while in Fig. 1074, p. 677, a larger branch for the lower part of the vagina arises in common with the *internal pudic*. According to Quain ("Anatomy," 10th ed., vol. ii., part ii., p. 474), "the *vaginal artery* (*vesicovaginal*) in the female corresponds to the *inferior vesical artery* (*vesicoprostatic*) in the male. Arising from the *anterior division* of the *internal iliac*, or frequently from the uterine artery, it descends and ramifies upon the vagina, sending at the same time offsets to the lower part of the bladder, to the bulb of the vestibule, and to the contiguous part of the rectum. It anastomoses behind the vagina with the corresponding artery of the opposite side." The fact is that the vagina is normally supplied with blood from both the sources mentioned, the branch from the *uterine* (which might be termed the *superior vaginal artery*) and the branch from the *inferior vesical artery* (which might be termed the *inferior vaginal artery*) varying inversely with one another in size. In Fig. 997 is shown a slender vertically disposed artery occupying the median line of the posterior surface of the vagina; this is often much larger than in the specimen here figured, being supplied by offsets from both the *superior* and the *inferior vaginal arteries*, and is termed the *azygos artery of the vagina*. It is well shown in a plate by Hyrtl, reproduced as plate vi. of Hart and Barbour's "Gynecology," 3rd ed., 1886, facing p. 68.

[164] (Fig. 998, p. 610.) The *ophthalmic artery* terminates by dividing into the *frontal* and *nasal* branches. Macalister follows the Continental terminology in speaking of the latter as the *arteria dorsalis nasi*.

[165] *Angular Artery* (Ibid.).—The *facial artery* is described by English anatomists as terminating usually by division into the *lateral nasal* and *angular arteries*, the latter being the slender twig which inosculates at the inner side of the orbit with the *nasal branch* of the *ophthalmic artery*. Toldt, however, gives the name of *arteria angularis* to the *facial* as soon as it has given off the *coronary artery of the upper lip*, and the *lateral nasal artery* is not mentioned by him. The last-named artery in the present specimen is represented by two or three slender twigs seen ramifying on the side of the nose.

[166] *Facial Artery* (Ibid.).—Quain gives *external maxillary*, and Macalister *external mandibular*, as an alternative name for this artery; but it is so rarely in England called anything but the *facial artery* that I have not thought it necessary to mention these synonyms in the text. Conversely, the *internal maxillary* is sometimes, though rarely, spoken of as the *deep facial artery*.

[167] (Ibid.) The *hyoid branch* of the *lingual artery* usually runs along the upper border of the hyoid bone (in the figure, however, along the outer side of the great cornu), and is called by Macalister the *suprahyoidean artery*.

[168] (Ibid.) Very often called the *temporal artery*, without qualification. It has, however, to be distinguished from the *anterior* and *posterior deep temporal branches* of the *internal maxillary artery*, and from its own *middle deep temporal* (*middle temporal*) branch.

[169] *Sternocleidomastoid Artery* (Ibid.).—This is described by Von Langer and Toldt as a special branch arising from the posterior side of the *external carotid artery* above the hyoid bone, and arching downwards and outwards to enter the inner side of the sternocleidomastoid muscle. It is described also by Macalister, but not by Quain. It varies inversely in size with the *sternocleidomastoid branches* of the *occipital* and *superior thyroid arteries*, and is sometimes absent.

[170] *Acromial Rete* (Ibid.). — This name is sometimes given to the arterial network formed on the upper surface of the acromion by anastomosing branches of the *acromiothoracic*, *suprascapular*, and *posterior circumflex arteries*. I may add that the word *rete* in this section of the "Atlas" is used without qualification only in speaking of *arterial* retia. The *venous* retia are always distinguished by the qualifying adjective.

[171] *Arteria Labialis Inferior* (Fig. 999, p. 611).—Macalister describes the *inferior labial artery* as dividing into two branches: an upper, the *inferior coronary artery*, which runs near the free margin of the lower lip; and a lower, the *superficial mental artery*. Quain mentions the *inferior labial artery* and the *coronary artery of the lower lip* as being sometimes distinct branches of the *facial artery*, but sometimes arising in common from that artery.

[172] *Arteria Transversa Colli* (Ibid.).—Fig. 999 shows what the author describes as the normal distribution of the branches of the subclavian artery, in which the *superficial cervical artery* arises from the *thyroid axis*, while the *transverse cervical artery*, arising

separately from the *subclavian* trunk, terminates by dividing into *ascending* and *descending branches*, the former running upwards among the muscles of the neck to anastomose with the *cervical* or *descending branch of the occipital artery* (see note [10], p. 611), the latter becoming the *posterior scapular artery*. In Macalister's terminology the *ramus ascendens* is called the *cervical branch* of the *transverse cervical* or *posterior scapular artery*. The artery in question (*ramus ascendens*) has no regular place in Quain's terminology, for that author describes a *transverse cervical artery* from the *thyroid axis*, dividing into *superficial cervical* and *posterior scapular arteries*, as the most usual arrangement. In his account of the *varieties*, however, of the branches of the subclavian artery, Quain states that "The transverse cervical branch of the thyroid axis not infrequently consists solely of the superficial cervical artery; and it often happens that the vessel derived from the thyroid axis is very small, and represents only in part the superficial cervical artery, a large vessel being given off from the second or third part of the subclavian, and dividing near the levator anguli scapulæ into two branches, of which one ascends and represents the larger portion of the superficial cervical artery, while the other forms the posterior scapular" (*op. cit.*, vol. ii., p. 427). In this *variety* we have the arrangement described by Toldt as *normal*. See also notes [134] and [135] above and note [5] to p. 629.

[173] *Cricothyroid Artery* (Fig. 1000, p. 612).—Called by Macalister the *inferior laryngeal branch* of the *superior thyroid artery*. This artery is endangered in the operation of laryngotomy.

[174] *Superior Phrenic Arteries* (Ibid.).—Several branches to the upper surface of the diaphragm are supplied by the *internal mammary artery*. I. The *comes nervi phrenici* of English authors, called by Toldt *arteria pericardiophrenica*, shown here on both sides, accompanies the phrenic nerve, and supplies *pericardial* as well as *phrenic* branches. Quain gives *superior phrenic* as an alternative name for this artery. II. The *internal mammary* terminates by dividing into *superior epigastric* and *musculophrenic branches*, the latter giving off the three lowermost *anterior intercostal arteries* as well as supplying the diaphragm. III. On the right side of Fig. 1000, the author shows another branch supplied to the diaphragm by the internal mammary artery, and this he names *arteria phrenica superior*.

[175] *Thymic Artery* (Ibid.).—This small offset, which in the adult supplies the remains of the thymus gland, is one of the *anterior mediastinal branches* of the *internal mammary artery*.

[176] *Posterior Meningeal Artery* (Fig. 1001, p. 613).—This name is, in England, more often given to the *meningeal* branch of the *vertebral artery* (see Fig. 1003, p. 615, and Fig. 1007, p. 619) than to the *meningeal* branch of the *ascending pharyngeal artery*. The name is, however, equally applicable to both; and, in fact, the *ascending pharyngeal* usually supplies the dura mater with a larger vessel than that derived from the *vertebral artery*.

[177] *Costocervical Axis* (Ibid.).—This name for the trunk by which the *superior intercostal* and the deep *cervical arteries* usually arise in common from the second part of the subclavian artery is used by Macalister, but not by Quain.

[178] **Deep Branch of the Ascending Cervical Artery* (Fig. 1003, p. 615).—"A very variable offset of the *ascending cervical artery*, known as the **ramus profundus*, passes backwards to the deep muscles of the back of the neck" (Von Langer and Toldt, *op. cit.*, p. 512). Neither Quain nor Macalister distinguishes this branch by name from the other *muscular* offsets of the *ascending cervical artery*.

[179] *Lachrymal Gland* (Fig. 1004, p. 616).—Regarding the distinction made by the author, and by some English anatomists also, between the two portions of this gland, named respectively *superior* and *inferior lachrymal gland*, see note [1] to p. 911 in Part VI. of this work.

[180] **Arteria Labialis Inferior* (Ibid.).—The upper of the two vessels denoted in Fig. 1004 by the name of *inferior labial artery* is called by Quain the *coronary artery of the lower lip;* and by Macalister, the *inferior coronary artery*. The lower of the two is itself the *inferior labial artery* in Quain's nomenclature, whilst Macalister calls it the *superficial mental artery*. See note [171] above.

[181] *Rami Gingivales Superiores* (Fig. 1005, p. 617).—As is well shown in the figure, the *superior gingival branches* are offsets of an anastomotic arch lying below the malar process on the zygomatic and anterior or facial surfaces of the superior maxillary bone, this arch being formed behind by the *posterior* (*superior*) *dental* (*or alveolar*) *artery*, and in front by a branch of the *infra-orbital artery*.

[182] *Ramus Tonsillaris* (Ibid.).—In this preparation (Figs. 1005 and 1006) and in the two next following (Figs. 1007 and 1008), the *inferior or ascending palatine artery* furnishes a *tonsillar branch*. Sometimes, however, this branch is wanting, and a separate *tonsillar artery* arises from the *facial* trunk.

[183] *Arteriæ Tympanicæ* (Ibid.).—Four *tympanic arteries* are described in Von Langer and Toldt's "Anatomy": The *anterior tympanic*, derived from the *deep auricular branch* of the *internal maxillary artery;* the *posterior tympanic*, a branch of the *stylomastoid artery*, which is itself derived from the *posterior auricular artery;* the *superior tympanic*, derived from the *middle* or *great meningeal artery;* and the *inferior tympanic*, derived from the *ascending pharyngeal artery*. By Quain these are termed the *tympanic branches* (without further qualification) of their respective trunks. The *petrosal* or *Fallopian branch* of the *middle* or *great meningeal* and the *tympanic branch* furnished by the *internal carotid artery* in the carotid canal also supply the tympanum. By their anastomoses the tympanic vessels form a vascular circle round the margin of the membrana tympani. The *anterior tympanic artery* is seen on p. 617, the *superior tympanic artery* on p. 621.

[184] *Arteriæ Ethmoidales et Arteriæ Nasales Anteriores Septi* (Fig. 1006, p. 618).—These small branches of the *ophthalmic artery* are variously named in England. *Internal nasal* is an occasional synonym for the *anterior ethmoidal artery*. Quain, in the section on Angeiology, calls the *nasal* branch of the *anterior ethmoidal* the *anterior nasal artery;* in the section on the Organs of the Senses, however, the branches shown in Fig. 1006 ramifying on the septum are termed by him the *septal branches* of the *anterior* and *posterior ethmoidal arteries*.

[185] *Arteria Sphenopalatina* (Ibid.).—The *sphenopalatina* or *nasal artery*, a branch of the third (terminal) part of the *internal maxillary artery* in the sphenomaxillary fossa (its origin is shown in Figs. 1005 and 1007), enters the nasal fossæ through the sphenopalatine foramen. The *pterygopalatine* or *pterygopharyngeal artery*, which passes backwards through the canal of the same name (*canalis pharyngeus*, according to Toldt) to supply the fornix of the pharynx and the sphenoidal sinus, is often a branch of the *sphenopalatine artery*, but is sometimes separately derived from the *internal maxillary* trunk. Macalister further describes a *descending pharyngeal branch* of the *sphenopalatine artery*, but this is mentioned neither by Quain nor by Von Langer and Toldt. The *sphenopalatine artery* is distributed chiefly to the nasal fossæ, its branches being called by Von Langer and Toldt *arteriæ nasales posteriores, laterales, et septi*, and by Macalister the *posterior nasal arteries*. "One long branch, the *nasopalatine artery* or *artery of the septum*, runs downwards and forwards in the groove on

the vomer, and ends in a small vessel which enters the incisor foramen to communicate with the descending palatine artery" (Quain, *op. cit.*, vol. ii., p. 406). According to Macalister's nomenclature, the *nasopalatine artery* divides into *superior* and *inferior* branches, the latter being that which passes through the incisor foramen. Von Langer and Toldt regard the *arteria nasopalatina* as the terminal branch of the *arteria palatina descendens*, which *ascends* through the incisor foramen (canal of Stensen) to anastomose with one of the *arteriæ nasales* previously mentioned (see note [188] below). These are merely two different ways of regarding the same anatomical data.

[186] *Rami Dorsales Linguæ* (Ibid.).—The *lingual artery* may supply a single *dorsal artery of the tongue* on either side, or (as here) several *dorsal lingual branches*.

[187] *Internal Carotid Artery* (Ibid.).—Two branches are given off from the second or intra-osseous portion of this vessel: (1) the *tympanic branch* (*ramus caroticotympanicus*), which passes through one of the caroticotympanic canaliculi and anastomoses with the other *tympanic arteries* (see note [183] above); and (2) the *Vidian branch* (not shown in Fig. 1006), which anastomoses with the *Vidian branch* (*arteria canalis pterygoidei Vidii*) of the internal *maxillary artery*.

[188] *Arteria Palatina Descendens*, **Arteria Palatina Major*, *et* **Arteriæ Palatinæ Minores* (Fig. 1007, p. 619).—The *superior* or *descending palatine artery*, arising in the sphenomaxillary fossa from the third (terminal) portion of the internal maxillary artery (see Fig. 1005, p. 617), sometimes gives off the *Vidian artery*, which may, however, arise separately from the *internal maxillary* trunk; it also gives small branches which descend in the posterior and external accessory palatine canals to supply the soft palate and the tonsil—these, called by Toldt **arteriæ palatinæ minores*, are left unnamed by Quain and Macalister, but may be termed the **accessory palatine arteries*; descending in the posterior palatine or palatomaxillary canal, the *superior* or *descending palatine artery* emerges on the inferior surface of the hard palate accompanied by the large palatine nerve, and runs forward in one of the *palatine grooves; in this situation its name is unchanged in the English nomenclature; the author, however, now calls it **arteria palatina major*, the **great palatine artery*; the vessel terminates, as described in note [185] above, by ascending through Stensen's canal to anastomose with the *nasopalatine artery* or *artery of the septum*.

[189] *Rami Gingivales Inferiores* (Ibid.).—The *inferior gingival branches* are derived partly from the *sublingual artery*, partly, also, from the *submental artery*, and from the *mylohyoid branch* of the *inferior dental* (or *alveolar*) *artery*.

[190] *Meningeal Branch of the Vertebral Artery* (Ibid.).—It is to this vessel that the name of *posterior meningeal artery* is commonly applied by English anatomists. The small vessel seen emerging from the jugular foramen, to which the name *arteria meningea posterior* is given by the author, is an offset of the *ascending pharyngeal* artery. (See also note [176] above.)

[191] **Arcus Raninus* (Fig. 1008, p. 620).—"Near the tip of the tongue the two *ranine arteries* communicate by means of a small loop (Krause), but with this exception the right and left arteries do not form other than capillary anastomoses" (Quain, *op. cit.*, vol. ii., p. 396).

[192] *Rami Musculares Arteriæ Ophthalmicæ* (Fig. 1010, p. 621).—Some of these are named by English anatomists. Quain writes: "Small *muscular* offsets arise at uncertain intervals from the trunk of the *ophthalmic artery*, as well as from the *lachrymal* and *supra-orbital branches*; in addition to these there are two more regular branches, an *external*, which is distributed to the upper and outer muscles of the orbit, and an *internal*, larger and more constant, to the lower and inner muscles" (*op. cit.*, p. 409). Macalister calls these branches *superior* and *inferior muscular*, respectively, and describes also a special *muscular artery to the external rectus*.

[193] *Ramus Orbitalis Arteriæ Meningeæ Mediæ* (*Var.*) (Ibid.).—There is normally a small communicating branch, called by Quain the *orbital branch* of the *middle* or *great meningeal artery*, passing from the trunk of this vessel or from its anterior division through the outer end of the sphenoidal fissure (or through a special aperture in the great wing of the sphenoid bone) to join a branch of the *lachrymal artery*, and the *ramus orbitalis* here figured is a larger homologue of this vessel. Macalister names it the *lachrymal branch* of the *middle meningeal artery*, and in one place (*op. cit.*, p. 582) describes it as supplying the lachrymal gland; in another (p. 657), he states that the *lachrymal artery* (*ex arteriâ ophthalmicâ*) "receives a large branch through the sphenoidal fissure from the *middle meningeal artery*, this branch varying inversely in size with the *lachrymal artery* itself."

[194] *Arteria Tympanica Superior* (Ibid.).—Usually known in England by the name of the *tympanic branch* of the *middle* or *great meningeal artery*. (See note [183] above.)

[195] *Arteriæ Cerebelli* (Fig. 1011, p. 622).—Some confusion is liable to arise regarding the nomenclature of the *cerebellar arteries*, and for this reason the use of double names is better avoided, and I adhere to those employed by Macalister. These vessels are three in number, two being offsets of the basilar artery, the third being derived from the vertebral: (1) *Arteria cerebelli inferior anterior*, the *anterior cerebellar artery* (Macalister); this arises from the posterior extremity of the *basilar artery*; Quain calls it the *anterior* (*inferior*) *cerebellar artery*, Ellis the *anterior cerebellar artery*. (2) *Arteria cerebelli superior*, the *superior cerebellar artery* (Macalister), this arises from the anterior extremity of the *basilar artery*, being commonly described as one of the terminal branches of that vessel; Quain and Ellis also call this the *superior cerebellar artery*. (3) *Arteria cerebelli inferior posterior*, the *posterior cerebellar artery* (Macalister); this arises from the *vertebral artery*; Quain calls it the (*posterior*) *inferior cerebellar artery*, Ellis the *inferior cerebellar artery*.

[196] *Operculum* (Fig. 1012, p. 623).—This name is given to the portions of the frontal and parietal lobes lying between the ascending and posterior branches of the fissure of Sylvius, and covering the upper part of the central lobe or Island of Reil. It is sometimes called more fully the *operculum of the insula*; sometimes, also, the *operculum of Burdach*.

[197] **Vena Mediana Colli* (Figs. 1015, 1016, p. 626).—"When both *anterior jugular veins* are absent, or very small, we find in the median line the **median vein of the neck*, the radicles of which are beneath the chin, and which runs in the superficial fascia towards the *suprasternal notch* (or *fossa jugularis*); in this region it usually bifurcates into right and left branches, which enter the **jugular venous arch* in the *spatium interaponeuroticum suprasternale* [*suprasternal space*, or *Burns's space*—see note [123] above], or the lower part of the *median vein of the neck* may itself form part of the **jugular venous arch*" (Von Langer and Toldt, *op. cit.*, p. 542). Quain states that the anterior jugular vein varies greatly in size, and that the right and left veins may sometimes be united into a single median vessel for a part of their length. Macalister uses the term *vena mediana colli* as a synonym for the *anterior jugular* vein.

[198] (Fig. 1015, p. 626).—Called by Macalister *nervus descendens cervicis*. This branch is, however, still very commonly known by the old name of *descendens noni*, the *hypoglossal nerve*, the *twelfth*

cranial nerve of Soemmerring, being the *ninth cranial nerve, nervus nonus*, in the enumeration of Willis.

[199] *N. Cervicalis Descendens* (Ibid.).—This name is given here, but not in the section on Neurology, nor in Von Langer and Toldt's "Anatomy," to one of the *communicating branches* of the *cervical plexus* which join the *descending cervical* branch of the *hypoglossal nerve* (see note [198] above) to form the *ansa hypoglossi*.

[200] *Sinus Vertebralis Longitudinalis* (Ibid.).—"A double vertically disposed series of anastomoses also belongs to the internal vertebral venous plexuses. These are situate on the posterior surfaces of the bodies of the vertebræ, and connect the adjoining vertebral venous plexuses. Taken as a whole they constitute the so-called **longitudinal vertebral sinuses*, which extend as two parallel vascular chains on either side of the posterior common ligament right down to the coccyx" (Von Langer and Toldt, *op. cit.*, p. 540). Quain calls them the *anterior longitudinal spinal veins;* and this author describes also two *posterior longitudinal spinal veins*, between the dura mater and the posterior wall of the spinal canal. They are, however, "often much broken up in parts of their course." The term **longitudinal vertebral sinus* is not current in England, but Macalister, writing of the *internal vertebral venous plexuses*, remarks: "The whole system is extrathecal, but within the periosteum of the canal, and therefore on the same horizon as the system of cerebral sinuses" ("Anatomy," p. 260).

[201] *Venæ Intervertebrales* (Fig. 1016, p. 626).—The *intervertebral veins*, in the author's terminology, are those that drain the blood from the vertebral venous plexuses through the intervertebral foramina, passing, according to the region in which they issue, to the vertebral veins, the posterior branches of the intercostal and lumbar veins, and the lateral sacral veins. See also note [265] below).

[202] *Layers of the Deep Cervical Fascia* (Ibid.).—Macalister enumerates these as follows: (1) The *suprasternomastoid layer;* (2) the *substernomastoid layer*, which splits into two at the outer side of the great vessels of the neck, thus forming the *carotid sheath*, the posterior layer of this sheath being continuous with (3) the *post-pharyngeal fascia*, which passes from side to side across the median line behind the constrictors of the pharynx; (4) the *pretracheal fascia* passes from side to side from the front of the carotid sheath anterior to the trachea, and between this layer and the suprasternomastoid or superficial layer is *Burns's space* (see note [197] above), while below the pretracheal fascia passes into the thorax to join the pericardium as *Godman's fascia;* (5) the deepest transverse layer is the *prevertebral fascia* posterior to the post-pharyngeal fascia, but not distinguished from it in Figs. 1015 and 1016.

[203] *Subscapular Artery* (Fig. 1017, p. 628).—According to Quain's nomenclature, which is that usually accepted in England, the *subscapular artery* gives off a large *dorsal* branch, the *dorsal scapular artery, arteria dorsalis scapulæ;* and its downward continuation, often smaller than the dorsal branch, still receives the name of *subscapular* artery. According to Toldt, however, the *arteria subscapularis*, after giving off the *arteria circumflexa scapulæ* (*i.e.*, the *dorsal* branch aforesaid), becomes the *arteria thoracodorsalis;* and Macalister uses a similar terminology, describing the *long subscapular artery* as dividing into *dorsalis scapulæ* and *thoracicodorsalis*. He distinguishes the main trunk as the *long subscapular*, because one or two *short subscapular* branches (*rami subscapulares* according to Toldt) are given off by the axillary artery directly to the subscapularis muscle.

[204] (Ibid.) *Arteria thoracalis lateralis*, the *long thoracic artery*, supplies *rami mammarii, external mammary branches*, larger in the female than in the male, and especially large during lactation. The *long thoracic* itself is sometimes called the *external mammary artery*.

[205] *Parts of the Subclavian Artery* (Ibid.).—Von Langer and Toldt divide the subclavian artery into *two* parts only: the *thoracic* part extends from the commencement of the vessel to its emergence from the *scalene space (see note [1] to p. 277 in Part III. of this work); the *cervical* part, comprising the remainder of the artery, between the outer border of the scalenus anticus muscle and the lower border of the subclavius muscle, lies deep in the (greater) supraclavicular fossa. English authorities divide the vessel into *three* parts, *first, second*, and *third* (Macalister giving as alternative names, *pectoral, intermuscular*, and *cervical* stages). The *first* part, internal to the scalenus anticus muscle, and the *second* part, behind that muscle, thus correspond to the *thoracic* part of Von Langer and Toldt; while the *third* or *cervical* part of English authors is nearly identical with the *cervical* part of Von Langer and Toldt, the only difference being that by the former the *outer border of the first rib*, by the latter the *lower border of the subclavius muscle*, is regarded as marking the boundary between the *subclavian* and the *axillary artery*.

[206] *Branches of the Axillary Artery* (Fig. 1018, p. 629).—These are somewhat variable in their number and distribution, and they are very variously named by different authorities. By Von Langer and Toldt they are arranged in four groups, distributed respectively to the *anterior*, the *posterior*, the *internal* and the *external* wall of the axilla. I. *Branches to the Anterior Wall of the Axilla:* 1. *Arteria thoraco-acromialis*, usually known in England as the *acromiothoracic artery*, sometimes called the *acromial thoracic*, and by Macalister termed the *thoracico-acromial artery;* the named offsets of this vessel are four in number: *ramus subclavius*, the *clavicular branch; ramus pectoralis*, the *pectoral* or *thoracic branch* (there may be two or more of these, and among them in females is often an *external mammary* branch); *ramus acromialis*, the *acromial branch*, to the *acromial rete* (see note [170] above); and *ramus deltoideus*, the *descending* or *humeral branch*, which runs downwards beside the cephalic vein in the deltoideopectoral groove (see Part III., p. 282, Fig. 523.). 2. *Arteria thoracalis suprema*, the *superior* or *short thoracic artery*, described by Von Langer and Toldt as an "occasional" branch; this vessel is often derived from the *acromiothoracic artery*—an arrangement described by some anatomists as normal, the *acromiothoracic* trunk being then often called the *thoracic axis*, especially when the remaining *thoracic* branch (presently to be described), the *long thoracic artery*, has the same origin. II. *Branches to the Posterior Wall of the Axilla:* 3. *Arteria subscapularis*, the *subscapular artery*, called by Macalister the *long subscapular artery* (see note [203] above): the principal branch of this is the *arteria circumflexa scapulæ*, the *dorsal* branch of the subscapular artery, *dorsalis scapulæ*, or *dorsal scapular artery* of English authors, which passes backwards through the **internal axillary space* (see Part III., p. 312, Fig. 599, and note [1] to same page) or *subscapular triangle* (Macalister) to reach the infraspinous fossa; the *dorsal scapular* artery gives to the subscapular fossa what are variously described as *ventral branches* (Quain), *deep subscapular branch* (Macalister), or *infrascapular offset* (Ellis), and among the terminal offsets of this branch (or these branches) are the *ventral nutrient artery of the scapula* and the *superior articular artery of the shoulder;* in addition, the *dorsalis scapulæ* gives a *descending branch* (called by Young the *median branch*) which runs in the groove between the origins of the teres minor and teres major muscles to the inferior angle of the scapula: the continuation of the *subscapular artery* (commonly smaller than the *dorsal branch*) is renamed by Toldt *arteria thoracodorsalis*, and Macalister

follows the Continental usage in terming it the *thoracicodorsalis artery*, but by most English anatomists it is still called *subscapular artery* in this part of its course; it terminates in *muscular branches* to the latissimus dorsi, serratus magnus, teres major, and teres minor muscles. III. *Branches to the Internal Wall of the Axilla:* 4. *Arteria thoracalis lateralis*, the *long thoracic* (or *external mammary artery*), which gives *muscular branches* to the serratus magnus, pectoralis major, and pectoralis minor muscle, and *rami mammarii, external mammary branches* (see note [204] above). IV. *Branches to the External Wall of the Axilla:* 5. *Arteria circumflexa humeri anterior*, the *anterior circumflex artery* (of the arm). 6. *Arteria circumflexa humeri posterior*, the *posterior circumflex artery* (of the arm), which runs backwards through the **external axillary space* (see Part III., p. 312, Fig. 589, and note [1] to same page) or *quadrilateral space* (Macalister), and gives numerous offsets, named by Macalister as follows: *Ascending branch*, to the teres minor muscle; *descending branch*, to the long head of the triceps; *nutrient branch*, to the great tuberosity of the humerus; *posterior articular artery*, to the shoulder-joint; *acromial branch*, to the *rete acromiale* (see note [170] above); and an *anastomotic branch* to the *superior profunda branch* of the *brachial artery*. *Fifth Group. Branches not enumerated by Von Langer and Toldt:* 7. The *alar thoracic artery* to the lymphatic glands and fatty tissue of the axilla; this is a very variable branch, and may arise (*a*) direct from the *axillary trunk*, (*b*) from the *long thoracic artery*, (*c*) from the *thoracic axis* (*acromiothoracic artery*). 8. In females there is occasionally an independent *external mammary artery*, arising from the *axillary trunk* below the origin of the *posterior circumflex artery*. *Sixth Group.* 9. *Rami subscapulares*, the *short subscapular arteries*, must also be mentioned, usually two in number, small vessels passing backwards from the *axillary trunk* to the subscapularis muscle.

[207] *Parts of the Axillary Artery* (Ibid.).—By Von Langer and Toldt, as by English anatomists, the axillary artery is divided into three parts, but the limits of these parts are not exactly identical in the Continental and the English description. As already mentioned (see note [205] above), according to Von Langer and Toldt, the subclavian artery becomes the axillary at the lower border of the subclavius muscle, but according to English anatomists at the outer border of the first rib. It is obvious that the English boundary is more precise, inasmuch as the position of the subclavius muscle varies with the varying elevation of the shoulder. The *first* part of the axillary artery extends from its commencement to the upper border of the pectoralis minor muscle. The *second* part of the artery lies beneath (behind) the pectoralis minor muscle. The *third* part of the vessel extends from the lower border of the pectoralis minor muscle to the termination of the vessel. In this respect, again, there is a difference between the Continental and the English usage, for according to the former, the axillary artery becomes the brachial opposite the lower (outer) border of the pectoralis major muscle; but according to the latter, opposite the lower (outer) border of the teres major muscle. Thus, the third part of the axillary artery, as the term is understood in England, is nearly twice as long as the third part of the vessel as described by Von Langer and Toldt.

[208] *Arteria Cervicalis Superficialis* (Ibid.).—"The *superficial cervical artery* is distributed to the superficial structures of the (greater) supraclavicular fossa, to the trapezius, levator anguli scapulæ, rhomboideus major, serratus posticus posterior, and splenius capitis muscles. Its size and the area it supplies are exceedingly variable; it may entirely replace the *transverse cervical artery* (*arteria transversa colli*), or, conversely, be entirely replaced by that vessel. Normally it is one of the principal branches of the thyroid axis" (Von Langer and Toldt, *op. cit.*, p. 512). Quain's use of the term *superficial cervical artery* is explained in notes [134], [135], and [172] above.

[209] *The Branches of the Brachial Artery* (Fig. 1019, p. 630).—1. *Arteria profunda brachii*, the *superior profunda artery* (of the arm), which gives the following offsets: (*a*) *Ramus deltoideus*, the *communicating branch* (Macalister) or *deltoid branch* (Quain), which anastomoses beneath the deltoid muscle with branches of the *posterior circumflex artery*; (*b*) *arteria nutricia humeri*, the *nutritious* (Macalister) or *medullary branch* (Quain); (*c*) *arteria collateralis media*, the *muscular branch to the inner head of the triceps muscle*; (*d*) *arteria collateralis radialis* (regarded in England as the terminal portion of the superior profunda artery itself), the *anterior terminal branch* of which passes with the musculospiral nerve through the external intermuscular septum, and anastomoses with the radial recurrent artery, while the *posterior terminal branch* passes along the back of the external intermuscular septum, and ends in the *rete olecrani*, anastomosing there with the *inferior profunda, anastomotica magna, posterior ulnar recurrent*, and *interosseous recurrent arteries*. There are, further, (*e*) the *muscular branch to the long head of the triceps muscle*; (*f*) a *cutaneous branch* with the inner cutaneous branch of the musculospiral nerve. 2. *Arteria collateralis ulnaris superior*, the *inferior profunda artery*, which supplies the inner head of the triceps, and ends in the *rete olecrani* already described. 3. *Arteria collateralis ulnaris inferior*, the *anastomotic branch* (*anastomotica magna*), which runs in the inner bicipital furrow, perforates the internal intermuscular septum, and joins the *rete olecrani*; it gives an *anterior branch* which descends between the brachialis anticus and pronator radii teres muscles in front of the internal condyle to anastomose with the *anterior ulnar recurrent artery*. 4. In addition to the *medullary* or *nutritious* branch of the *superior profunda*, there is another and larger vessel supplied to the humerus called the *chief medullary artery*, which usually arises in common with the *upper muscular branch to the brachialis anticus muscle*; the foramen for the chief medullary artery is just below the insertion of the coracobrachialis muscle, that for the nutrient branch of the superior profunda is higher up, near the top of the spiral groove. 5. Small *muscular* branches are furnished by the *brachial artery* during its course, and are stated by Macalister to be usually eight in number. 6. According to Macalister, a *vas aberrans*, arising close to or in common with the *superior profunda artery*, descending over the median nerve, supplying the biceps, and ending by joining the radial (or less commonly the ulnar) artery, is usually present, but often so small as to escape injection; other authorities speak of its presence as exceptional When large it may replace and simulate the brachial artery, which then appears to be superficial to the median nerve. If moderately large, it may replace the ordinary origin of the radial artery (rarely that of the ulnar artery); we thus have the condition, often met with, called the *high bifurcation of the brachial artery*. "A very interesting variety in the origin of the branches of the brachial artery is that in which the *superior profunda artery*, the *inferior profunda artery*, and the *anastomotica magna artery* all arise by a common stem, from which the *circumflex arteries* and the *subscapular artery* are also derived. In such cases, the axillary artery, as it emerges from the axilla, is seen to divide into two trunks of equal size, one of which runs as far as the elbow without giving off any branches of importance, whilst the other supplies the structures of the shoulder and the upper arm. This condition resembles that normally met with in the distribution of the femoral artery" (Von Langer and Toldt, *op. cit.*, p. 516).

[210] *Upper Limit of the Brachial Artery* (Ibid.).—As already mentioned in note [207] above, according to Von Langer and Toldt the *axillary artery* becomes the *brachial artery* opposite the lower (outer) border of the pectoralis major; but according to English anatomists somewhat lower than this, opposite the lower (outer) border of the teres major muscle. The former definition is really a more accurate one, for the vessel is no longer in the axilla after it has emerged from behind the pectoralis major muscle. Macalister, indeed, goes further than this, remarking that the whole of the *third stage of the axillary artery* (so-called)—*i.e.*, from the lower border of the pectoralis minor to the lower border of the teres major muscle—"belongs to the arm, not to the axilla, and should properly be described as part of the brachial artery" ("Anatomy," p. 269). The distinction is, of course, one of definition merely, and has no practical significance.

[211] (Fig. 1020, p. 631.) Partly owing to the independent origin of the *muscular branch to the internal or deep head of the triceps muscle, arteria collateralis media*, the distribution of the branches of the *superior profunda artery* differs somewhat in this specimen from the description given in note [209] above (*q.v.*). Thus, the lower part of the *superior profunda artery*, called by the author *arteria collateralis radialis*, is seen to divide into two branches, the *anterior terminal branch* passing with the musculospiral nerve through the external intermuscular septum, and the *posterior terminal branch* passing to the back of the elbow to join in the formation of the *rete olecrani*. Higher up, a large *muscular branch to the external head of the triceps* is seen.

[212] *Rete Articulare Cubiti, Rete Olecrani, or Arterial Network of the Elbow* (Ibid.).—The vessels taking part in the formation of this plexus have been enumerated in note [209] above.

[213] *Digital Arteries* (Fig. 1022, p. 633).—In England the *palmar digital arteries* are usually spoken of as the *digital arteries* without qualification, the *dorsal digital arteries*, which are very much smaller than the *palmar*, being often ignored, except in the case of the *dorsal arteries of the thumb* and of *the index finger*. Moreover, the distinction made by the author between the *arteriæ digitales volares communes*, the *common palmar digital arteries* (before their bifurcation), and the *arteriæ digitales volares propriæ*, the *proper palmar digital arteries* (after their bifurcation), fully expressed in Quain's nomenclature. The *arteriæ digitales volares propriæ* of Toldt are by Quain termed *digital arteries* without further qualification; and these are said to divide into two *collateral branches* for the respective fingers, the *arteriæ digitales volares propriæ* of Toldt.

[214] *Anterior Annular Ligament of the Wrist* (Ibid.).—I take this opportunity of supplying an omission from the translation of Part III. (already published). The *anterior annular ligament of the wrist* consists of two layers, a *superficial* and a *deep*, the ulnar artery lying between them. The *superficial layer*, called by Toldt *ligamentum carpi volare*, is homologous with the *posterior annular ligament of the wrist* (*ligamentum carpi dorsale* of Toldt), both structures being specialized portions of the superficial layer of the deep fascia of the forearm; this superficial layer is continued below into the palmar fascia. The *deep layer*, called by Toldt *ligamentum carpi transversum*, arches over the median nerve and the nine flexor tendons, forming the anterior wall of the canal of the carpus, and is a specialized band of the intermuscular septum between the palmaris longus and the flexor sublimis muscles. The distinction between these two layers of the anterior annular ligament is not clearly indicated in all English text-books, but it is emphasized by Macalister (*op. cit.*, p. 309). In the translation of Part III. of this work, pp. 322, 324, 332, 334, I have rendered the terms *ligamentum carpi volare* and *ligamentum carpi transversum* indifferently as *anterior annular ligament of the wrist*.

[215] *Anterior Carpal Rete* (Fig. 1023, p. 634).—This arterial network lies beneath the lower edge of the pronator quadratus muscle, and in front of the carpus. It is supplied by the anterior radial carpal and anterior ulnar carpal arteries (a large communicating branch between these vessels constituting the *anterior carpal arch*); also by the anterior communicating or anterior terminal branch of the anterior interosseous artery, and by the recurrent or ascending branches of the deep palmar arch.

[216] *Superior Perforating Arteries* (Ibid.).—These small vessels, which pass through the proximal extremities of the intermetacarpal spaces, connecting the deep palmar arch with the posterior carpal rete (see note [219] below), are distinguished as *superior perforating* from the *inferior perforating arteries* which pass through the distal extremities of the intermetacarpal spaces, connecting the dorsal interosseous arteries with the (palmar) digital arteries. The *radial artery* itself, as it passes into the palm of the hand between the heads of the first dorsal interosseous (or abductor indicis) muscle, thus represents the *first superior perforating artery*. This is well shown in Fig. 1024

[217] *Arteria Collateralis Radialis* (Ibid.).—This name is given by the author to the lower part of the *superior profunda artery* (of the arm) of English authors, after it has given off the *arteria collateralis media*, the muscular branch to the inner head of the triceps muscle (see notes [209] and [211] above).

[218] (Ibid.). The *large artery of the thumb* and the *radial artery of the index finger*, the last branches furnished by the *radial* trunk before it turns inwards to form the *deep palmar arch*, are commonly known in England by their Latin names of *princeps pollicis* and *radialis indicis arteries*.

[219] *Posterior Carpal Rete* (Fig. 1024, p. 635).—This arterial network lies beneath the extensor tendons on the back of the carpus. It is supplied by the *posterior radial carpal* and *posterior ulnar carpal arteries* (a large communicating branch between these vessels constituting the *posterior carpal arch*); also by the *terminal* offsets of the *anterior* and *posterior interosseous arteries*; while the *superior perforating arteries* (see note [216] above) connect the *posterior carpal rete* with the *deep palmar arch*.

[220] *Dorsal Interosseous Artery* (Ibid.).—The *first dorsal interosseous artery*, called by Macalister the *metacarpal artery*, a branch of the radial artery, often arises, as in this instance, in common with the posterior radial carpal branch; it runs in the back of the interval between the second and third metacarpal bones. The *second* and *third dorsal interosseous arteries*, arising from the posterior carpal arch, are distributed in the back of the third and fourth interosseous spaces. See also note [222] below.

[221] *Superficial Veins seen in* Fig. 1028 (p. 638).—The arrangement of the superficial veins in this specimen is not that usually described as normal, but it is a very common variation from the normal, which will be better understood from an examination of the middle specimen of Fig. 1000, p. 697, in which the same arrangement is met with. A description of the **median vein of the elbow* is given in note [308] below. In Fig. 1028 the *radial vein*, having already given off the **median vein of the elbow*, has become the *cephalic vein* (see note [305] below); but the *ulnar vein* has not yet become the *basilic vein*, as it has not yet been joined by the **median vein of the elbow*. This ulnar vein has no doubt been formed by the confluence of *anterior* and *posterior ulnar veins*. In the author's terminology it is the *vena basilica* (see note [306] below). The vein (unnamed in the figure) lying just in front of the ulnar vein is most probably the *median vein* (of the forearm), which has inclined inwards to join the *ulnar vein*.

[222] (Fig. 1031, p. 639.) It will be noticed that the author numbers the *arteriæ metacarpeæ dorsales* according to the number of the interosseous space in which they lie. In Quain's nomenclature, however, the *arteria metacarpea dorsalis prima*, being very small, is ignored; and thus the *first dorsal interosseous artery* of Quain (*metacarpal branch* of the *radial artery*, according to Macalister) corresponds to the *arteria metacarpea dorsalis secunda* of the author. The Continental enumeration of these vessels is much to be preferred. See also note [220] above.

[223] *Femoral Artery* (Fig. 1033, p. 641).—The portion of this vessel above the origin of the *profunda* is often distinguished as the *common femoral*, that below the origin of the profunda as the *superficial femoral artery*.

[224] *Internal Circumflex Artery (of the Thigh)* (Ibid.).—According to Von Langer and Toldt's description (*op. cit.*, p. 525), the *arteria circumflexa femoris medialis* divides almost immediately after its origin from the profunda into a *ramus superficialis*, distributed to the muscles of Scarpa's space, and a much larger *ramus profundus*, which passes backwards between the pectineus and iliopsoas muscles above the small trochanter to the back of the neck of the femur and supplies the *ramus acetabuli* to the hip-joint. According to the description given by Quain, the *ramus superficialis* corresponds to unnamed *muscular branches*, while the *ramus profundus* is the continuation of the *internal circumflex artery* itself; arrived at the back of the femur it supplies an *articular branch*, the author's *ramus acetabuli*, the development of which is inversely proportional to that of the *articular branch of the obturator artery;* the internal circumflex finally divides into *ascending* and *transverse branches*, the former following the tendon of the obturator externus muscle to the digital or trochanteric fossa, and the latter ending in the *crucial anastomosis* (see note [230] below).

[225] *Rete Patellæ* (Ibid.).—The *patellar rete* is that portion of the *rete articulare genu*, the **articular rete of the knee*, which lies immediately in front of the patella. The term *patellar rete* is used by Macalister to denote the whole of the articular network of the knee; but Toldt limits the application of *rete patellæ* as above defined, and the latter's usage is to be preferred, on the score of accuracy. For an account of the *articular rete of the knee* as a whole see note [227] below.

[226] *Branches of the Femoral Artery in the Lower Part of Hunter's Canal* (Fig. 1034, p. 642).—The author's nomenclature of these differs from that usual in England. "The branches of the femoral artery for the region of the knee-joint often arise by a common trunk, the *arteria genu suprema*. This springs from the femoral artery just above the opening in the adductor magnus muscle, and runs down towards the capsule of the knee-joint in the substance of the vastus internus muscle near the common extensor tendon. It gives *rami musculares* to the vastus internus; a *ramus saphenus* which, descending beside the internal saphenus nerve, is distributed to the integument; and finally *rami articulares*, which contribute to the *rete articulare genu* [see note [227] below]. Often, however, the greater number of the *rami musculares* and the *ramus saphenus* are supplied by a separate branch of the femoral artery, which arises from that trunk somewhat higher up in Hunter's canal" (Von Langer and Toldt, *op. cit.*, pp. 526, 527). According to Quain's description, several *muscular branches* are supplied by the femoral artery in Hunter's canal, the lowermost of which, constant, and of considerable size (sometimes derived from the upper part of the popliteal artery), passes outwards across the back of the femur, perforating the short head of the biceps and the external intermuscular septum, to end in the crureus muscle. The *anastomotic artery* arises from the femoral a little above the opening in the adductor magnus, and divides almost immediately into two branches (which are in many cases derived separately from the femoral trunk). The *superficial branch* runs down with the internal saphenous nerve; the *deep branch* courses along the front of the tendon of the adductor magnus muscle to the internal condyle of the femur. It supplies *articular branches* to the *rete articulare genu*. From these descriptions it will be apparent that the *anastomotic artery* is identical with the author's *arteria genu suprema*, and the *superficial branch* of that vessel with the author's *ramus saphenus*.

[227] **Rete Articulare Genu* (Ibid.).—The **articular rete of the knee* is an arterial network over the front and sides of the knee-joint. It consists of two layers: a *superficial*, with wide meshes and very minute constituent vessels, lying between the skin and the deep fascia; and a *deep*, with finer meshes and larger constituent vessels, actually in contact with the bones. The *patellar rete* is that portion of the network situate immediately in front of the patella, but the term is by English anatomists usually applied (inaccurately) to the network as a whole. The vessels supplying the rete are six in number, viz., the four lateral *articular* branches of the popliteal, the *anastomotic* branch of the femoral, and the *recurrent* branch of the anterior tibial artery.

[228] *Hunter's Canal* (Ibid.).—It is to be noted that the author uses the term *Hunter's canal* in a sense different from that attached to it by English anatomists. We find the following description in Von Langer and Toldt's "Anatomy," 7th ed., p. 263: "The *fossa iliopectinea* (*Scarpa's triangle*) . . . passes below into a groove, bounded internally by the adductor muscles and externally by the vastus internus muscle, and extending downwards along the long axis of these muscles. Already at the upper part of the middle third of the thigh, this groove is roofed by the sartorius muscle, and in addition, from about the middle of the thigh downwards, it is covered by a strong tendinous membrane, which stretches across from the commencement of the tendon of the adductor magnus muscle to the vastus internus muscle. Thus the groove is converted into a closed canal, *canalis adductorius Hunteri* (*Hunter's canal*)." If this description leaves the point still undecided, the description of Fig. 1034 shows clearly that the fascial layer there figured covering the lower part of the femoral artery is the roof of Hunter's canal, the upper aperture of which is in the middle of the thigh. In England, however, the sartorius muscle is regarded as the roof of Hunter's canal, and that canal extends from the point at which the muscle comes to lie in front of the artery, *i.e.*, the apex of Scarpa's triangle, to the opening in the adductor magnus muscle. And while it is true that the accessory fascial roof of Hunter's canal is thicker and stronger below than above the middle of the thigh, that fascial roof exists wherever the femoral artery is covered by the sartorius muscle, and the well-defined upper margin of the fascia shown in Fig. 1034 is the product of dissection.

[229] *Gluteal Artery* (Fig. 1038, p. 646).—By English anatomists this vessel is described as dividing just after it emerges from the pelvis into a *superficial*, smaller, part, and a *deep*, larger, part; the latter, again, divides into *superior* and *inferior branches*. In Toldt's nomenclature the superficial part is called the *muscular branch* to the gluteus maximus muscle; whilst it is the continuation of the trunk of the *arteria glutæa superior* which divides into a *ramus superior* and a *ramus inferior*.

[230] *Trochanteric Rete and Crucial Anastomosis* (Ibid.).—The *anastomotic branch* of the *sciatic artery* (seen in Fig. 1038 running downwards and outwards along the lower border of the pyriformis muscle), the *ascending branch* of the *first* or *superior perforating artery*, the *transverse branch* of the *internal circumflex artery*, and

the *transverse branch* of the *external circumflex artery*, inosculate behind the great trochanter and in the digital fossa to form what is often called the *crucial anastomosis*. A lateral extension from this anastomosis, in the form of a network of fine vessels on the outer surface of the great trochanter, beneath the gluteus maximus muscle, constitutes the *trochanteric rete*.

[231] *Adductor Magnus Muscle* (Ibid.).—This is the posterior and inferior portion of the *adductor magnus muscle* as usually described by English anatomists, the anterior and superior portion of the same muscle being the *adductor minimus muscle* of Toldt. See note [2] to p. 345 in Part III. of this work.

[232] *Sural Arteries* (Fig. 1040, p. 648).—The *external and internal sural branches* of the *popliteal artery* are sometimes designated the *inferior muscular branches* (the *superior muscular branches* of the same trunk supplying the lower parts of the adductor magnus and hamstring muscles). The name *sural* is, however, preferable, as being more distinctive. The *cutaneous arteries of the calf*, long slender vessels, shown in Figs. 1040 and 1044, may arise, as in the specimen here figured, from the *sural arteries;* frequently, however, they are independent branches of the popliteal trunk. They are often distinguished by the name of *superficial sural arteries*.

[233] *Medullary or Nutritious Arteries of the Femur* (Fig. 1041, p. 649).—According to Von Langer and Toldt (*op. cit.*, pp. 525, 526) the *arteria nutricia femoris superior* is usually a branch of the *arteria perforans prima*, and the *arteria nutricia femoris inferior* (larger than the former) is usually a branch of the *arteria perforans tertia*. Quain, in the osteological section of his work, figures two arterial foramina in the shaft of the femur, near the upper and the lower end, respectively, of the linea aspera, but in the angeiological section he omits to mention the offset of the *first* or *superior perforating artery*, which enters the upper of these two foramina. The *principal medullary artery of the femur* (*arteria nutricia femoris inferior* of Toldt) is, according to Quain (*op. cit.*, vol. ii., part ii., p. 491), derived either from the *second* (*middle*) or from the *third* (*inferior*) *perforating artery*. An additional medullary artery is, according to this author, frequently derived from the *fourth perforating artery* (the *terminal* branch of the *deep femoral* or *profunda artery*). According to Macalister, the chief nutrient artery of the femur is usually derived from the *second* or *middle perforating artery*.

[234] *Popliteal Canal* (Ibid.).—This name is not used by Quain or Macalister. It is applied by the author to the space beneath (anterior to) the tendinous arch of the soleus muscle through which the posterior tibial vessels and nerve pass from the popliteal space beneath the soleus muscle. See Fig. 612, p. 363, and Fig. 620, p. 371, in Part III. of this Atlas, and also note [245] below.

[235] *External Tarsal Artery* (Fig. 1042, p. 650).—This name is used by Macalister. Quain, on the other hand, who leaves the small *internal tarsal arteries* unnamed, calls this vessel the *tarsal artery* without further qualification. The name used in the text is to be preferred.

[236] *Malleolar Arteries* (Ibid.).—Both the *anterior external* and the *anterior internal malleolar arteries* are branches of the *anterior tibial artery;* the *posterior internal malleolar artery* is a branch of the *posterior tibial artery;* and the *posterior external malleolar artery* (an offset left unnamed by Quain) is derived from the *peroneal artery*.

[237] *Retia Malleolaria* (Ibid.).—The *external* and *internal malleolar retia* are connected in front with the *dorsal rete of the foot* (see note [239] below), and behind and below with the *calcaneal rete* (see note [242] below). The *external malleolar rete* is supplied by the two *external malleolar arteries* (*anterior* and *posterior*—see note [236] above), and by a branch of the *external tarsal artery;* the *internal malleolar rete* is supplied by the two *internal malleolar arteries* (*anterior* and *posterior*—see note [236] above), and by branches of the *internal tarsal arteries*.

[238] *Fundiform Ligament of Retzius* (Ibid.).—This name is given to the undivided outer limb of the anterior annular ligament of the ankle, or ligamentum lambdoideum (see Fig. 614, p. 365, and Fig. 616, p. 367, and notes to same pages, in Part III. of this work).

[239] *The Dorsal Rete of the Foot and the Dorsal Interosseous Arteries* (Fig. 1043, p. 651).—The arrangement of the bloodvessels of the dorsum of the foot described as normal by Von Langer and Toldt in their "Anatomy" differs in some respects from that shown in Fig. 1043, which is, however, normal according to English anatomists. The German authors write (*op. cit.*, p. 530): "The *arteria tarsea lateralis* [*external tarsal artery*—see note [235] above] combines with direct branches of the *arteria dorsalis pedis* and with offsets of the *arteriæ tarseæ mediales* [*internal tarsal arteries*] to form the extensive *rete dorsale pedis*, from which numerous offsets to the tarsal bones are derived. From the anterior extremity of the *dorsal rete of the foot* three *arteriæ metatarseæ dorsales* [II.-IV., the *second, third, and fourth dorsal interosseous arteries*] proceed forwards. . . . These latter vessels are considerably reinforced by the *rami perforantes* [*posterior perforating arteries*] by means of which they are directly connected with the [*deep*] *plantar arch;* and in many instances the *second, third*, and *fourth dorsal interosseous arteries* are derived chiefly or exclusively from these *posterior perforating arteries*. In other cases, however, a vessel of considerable size arises from the outer side of the *dorsal artery of the foot*, known as the *arteria arcuata* [*metatarsal artery*], and arches forwards and outwards across the bases of the metatarsal bones to reach the outer border of the foot, receiving on the posterior or concave side of the arch numerous offsets from the *dorsal rete of the foot*, and supplying from the anterior or convex side of the arch the *second, third*, and *fourth dorsal interosseous arteries*. . . . The *first dorsal interosseous artery* is the direct continuation of the dorsalis pedis artery; and this vessel supplies not only the collateral *dorsal digital arteries* for the adjoining sides of the great and second toes, but also the *dorsal digital artery* for the inner side of the former."

[240] *Termination of Dorsalis Pedis Artery* (Ibid.).—The *dorsal artery of the foot* terminates by dividing into two vessels of unequal size. The smaller terminal branch, which is continued in the same direction as the parent trunk, is the *first dorsal interosseous artery* in Quain's nomenclature, but Macalister calls it the *dorsalis hallucis*. (Regarding the distribution of this vessel see the end of note [239] above.) The larger terminal branch, usually known as the *communicating branch to the deep plantar arch*, passes between the heads of the first dorsal interosseous muscle, communicates with the *external plantar artery* to complete the *deep plantar arch*, and provides the plantar digital vessels for both sides of the great toe and for the inner side of the second toe; for this reason Quain gives the alternative name of *plantar digital branch* to this vessel. Inasmuch, however, as it is in series with the other posterior perforating arteries, and is serially homologous with the perforating portion of the radial artery in the upper limb, the name of *first posterior perforating artery* would be more accurately descriptive than any other. Macalister, to conclude, calls it the *first interosseous perforating artery*.

[241] *Perforating Arteries* (Ibid.).—According to the English nomenclature, there are two sets of these vessels—*anterior* and *posterior*. The latter, to which alone the name of *rami perforantes* is given by the author, larger in size and more constant than the former, are offsets of the *deep plantar arch*, and are described in

notes [239] and [240] above. The *anterior perforating arteries* are small and inconstant vessels connecting the anterior extremities of the *dorsal interosseous arteries* with the *plantar digital arteries* adjacent to the terminal bifurcation of these vessels. The author calls them *rami anastomotici arteriarum metatarsearum dorsalium cum arteriis digitalibus plantaribus*.

[242] *Calcaneal Rete* (Fig. 1044, p. 652).—The arterial network over the back and the under surface of the heel communicates above with the *external* and *internal malleolar retia* (see note [237] above), and in front with the *plantar rete* (see note [243] below). It is supplied by the *external* and the *internal calcaneal branches*, the former being derived from the *peroneal artery*, and the latter from the *posterior tibial artery* (Von Langer and Toldt), from the *external plantar artery* (Quain), or from both these vessels (Macalister).

[243] *Plantar Rete* (Ibid.).—The fine-meshed arterial subcutaneous network over the sole of the foot communicates freely with the *calcaneal* and *malleolar retia* and with the *dorsal rete of the foot*, and in addition to the blood received from these sources is reinforced by numerous unnamed cutaneous offsets of the branches of the plantar arteries, which reach the rete by perforating the plantar fascia.

[244] (Fig. 1045, p. 653.) The fascia covering the popliteus muscle is reinforced by, and, indeed, to a large extent derived from, a downward expansion of the tendon of insertion of the semimembranosus muscle.

[245] *Lower Limit of the Popliteal Artery* (Ibid.).—There is some inconsistency in the account given both by Quain and by Macalister of the lower limit and point of division of the popliteal artery. According to the former author, "the popliteal artery . . . reaches from the opening in the adductor magnus to the lower border of the popliteus muscle, where it divides into the anterior and posterior tibial arteries." But in describing the relations of the artery Quain states that "its termination is beneath the upper margin of the soleus muscle" (*op. cit.*, vol. ii., part ii., p. 493). Macalister also states that the artery divides "at the lower border of the popliteus muscle" (*op. cit.*, p. 499); and a few pages later, in describing the termination of the artery, he tells us that it is exposed by removing the gastrocnemius *and the soleus* muscles (p. 509). Now, these statements are irreconcilable, for the *popliteal* or *oblique line* of the tibia (see Fig. 334, p. 136, in Part I.), which gives origin to the soleus muscle, at the same time marks the lower limit of the insertion of the popliteus muscle. Hence these muscles do not overlap, as is well shown by Fig. 612, p. 363, in Part III., and if the popliteal artery really divided at the lower border of the popliteus muscle, the soleus muscle could not possibly lie behind its termination. The description given by Von Langer and Toldt of the ending of this artery is at once more accurate and more consistent than that of the English anatomists just quoted. The German authors ("Anatomy," 7th ed., p. 527) describe the vessel as passing down behind the popliteus muscle to enter what they call the **popliteal canal* (see note [234] above)—*i.e.*, the space beneath (anterior to) the *tendinous arch of the soleus muscle*, and immediately thereafter dividing into anterior and posterior tibial arteries (see also note [249] below). The entrance to the *popliteal canal is also shown in Fig. 612. In not a few instances, indeed, the popliteal artery divides, as described by Quain and Macalister, at the lower border of the popliteus muscle, and in such cases, as stated in note [3] to p. 363, Part III., it is the *posterior tibial* vessels and nerve that enter the *popliteal canal; but this high division of the artery precludes the possibility of its termination lying beneath the upper part of the soleus muscle.

[246] *Soleus Muscle* (Fig. 1046, p. 654).—It is somewhat inconsistent of the author to speak of the *tibial head* (*caput*) and the *fibular head* of the soleus muscle, inasmuch as he gives the name of *triceps suræ* to the gastrocnemius and soleus, considered as a single three-headed muscle (see Figs. 617 and 618, pp. 368 and 369, in Part III.), of which two heads, the inner and outer head of the gastrocnemius, are superficial and attached to the femur, whilst the third head, the soleus, is deep, and attached to the bones of the leg. Moreover, the fibres from the fibula, those from the tendinous arch, and those from the tibia, form a continuous muscular mass, which is not separable into distinct *heads* (see Fig. 612, p. 363, in Part III.). Quain, however, falls into the same error when he writes: "The tibial *head* of the soleus is almost peculiar to man: among the lower animals it occurs, of small size, only in the gorilla, and sometimes in the chimpanzee" (*op. cit.*, vol. ii., part ii., p 264). It should, of course, read "the tibial *origin* of the soleus," etc.

[247] *Communicating Branches between Posterior Tibial and Peroneal Arteries* (Ibid.).—Quain writes (*op. cit.*, vol. ii., part ii., pp. 496, 497): "A *communicating* branch passes transversely beneath the flexor longus hallucis muscle, between the posterior tibial and peroneal arteries, about an inch above the ankle-joint. A second loop of communication between these vessels is sometimes present, lying in the fat beneath the tendo Achillis." It is this second loop which is seen in Fig. 1046, just above the severed extremity of the tendo Achillis; and in Fig. 1047, in addition to both the vessels above described, we see a large communicating branch two or three inches above the ankle-joint. In Von Langer and Toldt's "Anatomy" (7th ed., p. 528) the principal communicating branch between these vessels is called *ramus anastomoticus*.

[248] **Fibular Branch of the Anterior Tibial Artery* (Fig. 1047, p 655).—Quain and Macalister agree in calling this small vessel the *superior fibular* branch; but as there is no *inferior fibular* branch, the name used in the text is to be preferred.

[249] *Division of the Popliteal Artery* (Ibid.).—As explained in note [245] above, Von Langer and Toldt describe the popliteal artery as entering the *popliteal canal, and "immediately thereafter dividing into anterior and posterior tibial arteries." It is necessary to add that the German authors regard the *anterior tibial artery* as a *branch* of the *popliteal artery*, which latter vessel, in their view, terminates nearly an inch below the origin of the anterior tibial by division into the *posterior tibial* and *peroneal arteries*. According to the description usually given by English anatomists, on the other hand, the terminal branches of the *popliteal artery* are the *anterior* and *posterior tibial arteries*, while the *peroneal artery* is regarded as a *branch* of the *posterior tibial artery*. The difference is solely one of terminology.—I may, in conclusion, mention an actual but somewhat rare variety in which the popliteal artery divides into three terminal branches: the anterior tibial, posterior tibial, and peroneal arteries.

[250] *Branches of Internal Plantar Artery* (Fig. 1048, p. 656).—According to Von Langer and Toldt (*op. cit.*, p. 529), this vessel divides into a *ramus superficialis* (*superficial branch*) which supplies the abductor hallucis muscle, and a *ramus profundus* (*deep branch*) which sinks deeply into the inner plantar furrow (the interval between the abductor of the great toe and the short flexor of the toes). Quain (*op. cit.*, vol. ii., part ii., p. 498) enumerates the branches of the internal plantar artery as follows: (*a*) Small communicating branches to the digital arteries of the three inner clefts; (*b*) muscular branches; (*c*) cutaneous branches in the inner plantar furrow; (*d*) cutaneous branches to the inner border of the foot; (*e*) deep offsets to the bones and joints of the foot;

and, finally, (*f*) the internal plantar artery terminates opposite the head of the first metatarsal bone by joining the digital artery to the inner side of the great toe. According to Macalister (*op. cit.*, p. 515), one of the branches of the internal plantar artery, which accompanies and overlies the internal plantar nerve, "may join the superficial branch of the external plantar artery to form a *superficial plantar arch*. This, however, is seldom large enough to admit coarse injection."

[251] *Plantar Digital Arteries* (Ibid.).—The four arteries passing from the (deep) plantar arch to the four clefts between the toes, where they divide into the *collateral digital arteries*, "are called, on account of their course in the interosseous spaces of the metatarsus, *arteriæ metatarseæ plantares* [*plantar metatarsal arteries*]" (Von Langer and Toldt, *op. cit.*, p. 529). In England, however, these vessels are known simply as (*plantar*) *digital arteries;* sometimes, however, to distinguish them from the *collateral digital arteries* into which they divide, the digital trunks before division are known as the *common digital arteries*. (Cf. note [213], on the nomenclature of the digital arteries of the hand.)

[252] *Fascia Iliopectinea* (Fig. 1050, p. 658).—The exact significance of this term as used by the author is explained in note [1] to p. 390, in Part III. Here we see it forming the posterior layer of the femoral or crural sheath.

[253] (Ibid.) Or *pubic portion of the fascia lata;* this is continuous above and externally with the fascial layer called by the author *fascia iliopectinea* (see note [252] above, also the description at the foot of Fig. 598, p. 349, in Part III).

[254] *Nervus Tibialis* (Figs. 1054, 1055, p. 660).—In the author's nomenclature, the name *nervus tibialis* is given to the larger of the two terminal branches of the *great sciatic nerve* from the point of division of the parent trunk until the **tibial nerve* itself divides (usually just below the internal annular ligament of the ankle) into the *internal* and *external plantar nerves;* in England, however, the upper part of this nerve, as far as the lower border of the popliteus muscle, is known as the *internal popliteal nerve*, and for the rest of its course it receives the name of *posterior tibial nerve*.

[255] **Dorsal Interosseous Fascia* (Fig. 1056, p. 660).—"In connexion with the extensor brevis digitorum muscle, we find a well-developed *deep layer* of the *deep fascia of the dorsum of the foot*, known as the *fascia interossea dorsalis*, which forms a covering for the muscle and for the dorsal artery of the foot, and is connected above with the deep layer of the anterior annular ligament of the ankle" (Von Langer and Toldt, *op. cit.*, p. 267). Quain says merely: "The *fascia of the dorsum of the foot* is reduced to a thin membrane prolonged from the anterior annular ligament over the extensor tendons. Beneath it, deeper layers of fascia are placed over the short extensor of the toes and the interosseous muscles" (*op. cit.*, vol. ii., part ii., p. 268).

[256] **Plantar Interosseous Fascia* (Ibid.).—"In the region of the metatarsus, the principal branch of the external plantar artery runs between the second and the third layer of muscles, covered by the easily demonstrated *fascia interossea plantaris*, which separates the interosseous muscles from the adductor hallucis" (Von Langer and Toldt, *op. cit.*, p. 268). Reference to Part III. of this Atlas, Fig. 627, p. 378, and Fig. 628, p. 379, will show that the deep part of the external plantar artery and the fascial layer in question is between the *third* and *fourth* layers of the muscles of the sole as there enumerated, and not between the second and third, a different system of grouping being adopted. The **plantar interosseous fascia* is not described by Quain or Macalister, except vaguely, as "fascia covering the interosseous muscles."

[257] **Deep Layer of the Deep Fascia of the Sole* (Ibid.).—No account of the **fascia plantaris profunda* is to be found even in Von Langer and Toldt's "Anatomy." Examination of Fig. 1055 shows it to lie between the second and third layers of the muscles of the sole, and that it is, in fact, the layer of areolar tissue covering the adductor obliquus hallucis muscle.

[258] *Presacral Venous Plexus* (Fig. 1057, p. 662).—"The *lateral sacral veins* form, by their communications with one another and with the *middle sacral veins*, a plexus over the anterior surface of the sacrum. They receive branches from the sacral canal through the anterior sacral foramina, and open at two or three points into the internal iliac veins" (Quain, *op. cit.*, vol. ii., part ii., p. 540). The *middle sacral veins* unite (in most cases) to form a common trunk, which usually enters the left common iliac vein. The name I have selected as the most suitable English equivalent for the author's *plexus sacralis anterior* is used by Macalister. The plexus communicates in front with the hæmorrhoidal (or rectal) venous plexus, and behind with the anterior internal vertebral venous plexus (see note [267] below).

[259] *Venous Plexuses of the Vertebral Column* (Figs. 1061, 1062, p. 665).—Neither Quain nor Macalister employs a complete series of English terms corresponding to those used by Toldt in his description of the venous plexuses of the vertebral column. Quain, in his account of the veins of the spine, mentions the plexuses connected with these veins, but gives them no distinctive names. I have, therefore, given in the text the literal English equivalents of the Latin terms used by the author, except that I use the word *plexus* in the singular where he uses it in the plural. The **posterior external vertebral plexus* (see note [260] below), for instance, is, as Macalister says, "longitudinally continuous from the sacrum to the skull," and the same is true of the other *vertebral plexuses*. The author, however, regards the *internal vertebral venous plexuses* as made up of a chain of connected segmental plexuses (see note [269] below). Alternative names for some of the vertebral plexuses are given in the notes in the usual manner.

[260] **Posterior External Vertebral Venous Plexus* (Ibid.).—Macalister calls this the *plexus dorsalis* (of the vertebral column). According to Quain (*op. cit.*, vol. ii., part ii., pp. 532, 533), "the *dorsal spinal veins* are derived from the muscles and integument of the back, and form a plexus over the arches of the vertebræ." In another place in the same volume (p. 531) he calls it the *dorsal spinal plexus*. See also note [259] above.

[261] *The Condylar Emissary Vein, and the Venous Rete of the Anterior Condylar Foramen* (Fig. 1063, p. 666).—The *condylar emissary vein* passes from the lateral (sigmoid) sinus through the *posterior* condylar foramen to the beginning of the vertebral vein. It is distinguished by Macalister as the *posterior condyloid vein* from what this author calls the *anterior condyloid vein*. The latter is described by Quain (who does not, however, employ the name just given) as a venous ring surrounding the hypoglossal nerve in the *anterior* condylar foramen, which communicates internally with the occipital sinus and the intraspinal veins, externally with the vertebral veins and the plexus on the front of the spine (*i.e.*, the **anterior external vertebral plexus* of Toldt—see Fig. 1066, p. 669). The so-called *anterior condyloid vein* is shown in Fig. 1080, p. 685, under the name of **venous rete of the anterior condylar foramen*. Von Langer and Toldt describe it as follows: "The emissary veins from the venous ring surrounding the foramen magnum pass outwards through the anterior condylar foramina and, with their tributaries, form a network around the hypoglossal nerves, and are known as *retia canalis hypoglossi*" (*op. cit.*, p. 541).

[262] (Ibid.) Concerning the author's application of the term *arteria transversa colli* (*transverse cervical artery*), see Appendix, notes [134], [135], [172] and [208]; similar considerations apply to the use of the term *vena transversa colli* (*transverse cervical vein*). Macalister gives *posterior scapular* as an alternative name for these vessels.

[263] **Posterior Internal Vertebral Venous Plexus* (Fig. 1064, p. 667).—"Within the spinal canal and on the back of the theca vertebralis there is a close plexus of veins, the *postero-internal plexus*, whose main trunks are longitudinal on the inside of the articular masses" (Macalister, *op. cit.*, p. 260). "The *posterior longitudinal spinal veins* . . . two in number . . . are often much broken up in parts of their course, and they communicate with one another by numerous cross-branches on the anterior surface of the arches of the vertebræ" (Quain, *op. cit.*, vol. ii., part ii., p. 533). Here we have two different modes of regarding the same anatomical data. See also note [239] above.

[264] *Lateral and Sigmoid Sinuses* (Ibid.).—The common English usage is to extend the meaning of the term *lateral sinus* so as to include that sinus which (following Macalister as well as Toldt) is here distinguished as the *sigmoid sinus*. Thus, according to Quain and the majority of English anatomists, the *lateral sinus* extends from the internal occipital protuberance to the jugular foramen. In this work, however, it is regarded as extending from the internal occipital protuberance to the point where the channel for the sinus passes from the cerebral surface of the parietal to the cerebral surface of the temporal bone. At this point the lateral sinuses "in their archaic fœtal condition communicated through the post-glenoid foramen with the primitive external jugular vein, but this connexion early diminishes, and is ultimately represented only in rudiment by the mastoid vein; an original small channel of communication from the lateral sinus to the posterior lacerate foramen becomes commensurately dilated, and appears in the adult as its continuation, the *sigmoid sinus*" (Macalister, *op. cit.*, p. 533).

[265] **Venous Rete of the Intervertebral Foramen* (Ibid.).—Writing of the *posterior longitudinal spinal veins* and the **posterior internal vertebral venous plexus* (see note [263] above), Quain states (*op. cit.*, vol. ii., part ii., p. 533): "From the plexus . . . offsets pass outwards to the intervertebral foramina, where they join the similar branches given off by the anterior longitudinal veins, and form a plexus around the issuing nerve;" but this author does not make use of the name given above. Macalister merely says that through each intervertebral foramen there emerges an outflowing *ramus spinalis* [*i.e.*, the **intervertebral vein*] to join the *plexus dorsalis* [*i.e.*, the **posterior external vertebral venous plexus*—see note [260] above].

[266] *Torcular Herophili, or Confluence of the Sinuses* (Ibid.).—Properly this name should be applied only to a somewhat rare arrangement of the sinuses, when a true *confluens sinuum* is exhibited at the common meeting-point of the superior longitudinal sinus, the straight sinus, the occipital sinus, and the right and left lateral sinuses. The usual arrangement is for the superior longitudinal sinus to be continued into the right lateral sinus, a dilatation marking the angle of union, this dilatation receiving the occipital sinus, and being conventionally called the *torcular Herophili*; the straight sinus turns to the left into the left lateral sinus, and the right and left lateral sinuses are commonly connected at their origin by a larger or smaller communicating vein. Sometimes this arrangement is reversed, the superior longitudinal sinus being continued into the left, the straight sinus into the right lateral sinus. (See Fig. 1234, p. 804, in Part VI.) The lateral sinus that receives the superior longitudinal sinus is larger than that which receives the straight sinus. Something approaching a true *confluence of the sinuses* is seen in Fig. 1064, in which the superior longitudinal sinus divides, a larger right division being continuous with the right lateral sinus, and a smaller left division being continuous with the left lateral sinus. The termination of the straight sinus in this specimen is not apparent in the figure, but the occipital sinus passes to the commencement of the right lateral sinus.

[267] **Anterior Internal Vertebral Venous Plexus* (Fig. 1065, p. 668).—The *postero-internal plexus*, says Macalister (*op. cit.*, p. 260), is connected by transverse branches "with the still larger *antero-internal plexus*, which lies on the backs of the bodies of the vertebræ. The main stems of this latter are two long veins which pass from end to end of the vertebral canal on the roots of the pedicles of the vertebræ. Across the back of every body these are joined by a cross-branch. Each of these anterior transverse branches receives the *basivertebral vein* from the cancelli of the vertebral body." Quain gives no name to this plexus, but states (*op. cit.*, vol. ii., part ii., p. 533) that "the *anterior longitudinal spinal veins* are two large plexiform vessels which extend the whole length of the spinal canal, lying behind the bodies of the vertebræ, one along each edge of the posterior common ligament." Young (U.S.) calls this plexus the *anterior intraspinal plexus*. (See also note [200] above.)

[268] *Basivertebral Veins* (Ibid.).—Quain calls these veins the *internal veins of the bodies of the vertebræ*, which is cumbrous. The name *basivertebral veins* is current, and sufficiently distinctive. Young (U.S.) calls them *venæ basis vertebrarum*, of which the name used in the text is a convenient modification. For their connexion with the **anterior internal vertebral plexus*, see note [267] above.

[269] **Venous Retia of the Vertebræ* (Ibid.).—"The *plexus venosi vertebrales interni* are mainly constituted by individual circularly-disposed extrathecal networks, the *retia venosa vertebrarum*, which, in each vertebra, are attached in front to the posterior surface of the vertebral body, and are in apposition behind with the neural arch. There are, therefore, as many vertebral venous retia as there are vertebræ in the spinal column. Their series is completed above by a plexiform vascular ring surrounding the foramen magnum" (see notes [259] and [261] above).—Von Langer and Toldt, *op. cit.*, p. 540.

[270] **Venous Plexus of the Nipple* (*Circulus Venosus of Haller*) (Fig. 1068, p. 671).—Von Langer and Toldt, after stating that the veins of the breast correspond in distribution and nomenclature with the arteries of that organ, write (*op. cit.*, p. 411): "Noteworthy is the *plexus venosus mamillæ* in the region of the areola, which is nothing more than a ring-shaped anastomotic chain of small subcutaneous veins surrounding the nipple (mamilla)." The term **venous plexus of the nipple* is not used by Quain or Macalister, but the former authority remarks (*op. cit.*, vol. iii., part iv., p. 290) that "Haller described a sort of anastomotic venous circle surrounding the base of the nipple as the *circulus venosus*";" and the latter, describing the blood-supply of the breast, writes (*op. cit.*, p. 264): "Some of the veins are deep, and accompany the arteries; others form a superficial circle of anastomosis in the areola, and end in the superior thoracic vein."

[271] **Costo-axillary and *Thoracico-epigastric Veins* (Ibid.).—"Of considerable importance are the anastomotic connexions between the axillary vein and the intercostal veins, on the one hand, and between the axillary vein and the subcutaneous venous network of the anterior abdominal wall, on the other. The former is affected by a number of venous radicles, known as the **venæ*

costo-axillares, which arise in the region of distribution of the seven uppermost intercostal veins, and open by a common trunk into the axillary vein. The second series of communications takes place by means of the **venæ thoraco-epigastricæ;* these arise in the region of distribution of the superficial epigastric vein or are directly continuous with the branches of this vein and run on each side of the trunk directly upwards to the axilla, where they open into the axillary vein, sometimes by an independent trunk, sometimes by joining the long thoracic vein. Since the superficial epigastric vein is a tributary of the femoral vein, this elongated anastomosis affords a direct channel of communication between the axillary vein and the femoral vein" (Von Langer and Toldt, *op. cit.*, *p.* 547).

[272] *External Pudic Arteries and Veins* (Ibid.).—These are two in number, *superior* and *inferior*. Both the veins are seen in Fig. 1068; but of the arteries, the *superior* only is visible, the *inferior* being beneath the fascia lata. For the names given to these vessels by Macalister, see note [5] to p. 599.

[273] *Venous Circle of the Umbilicus and Para-umbilical Veins* (Ibid.).—The **venous circle of the umbilicus*, which is not described by Quain or by Macalister, is an anastomotic chain of small subcutaneous veins surrounding the navel, similar to the *circulus venosus* of Haller surrounding the nipple (see note [270] above). The *para-umbilical veins*, in the peritoneum adjacent to the umbilicus and to the round ligament of the liver, form one group of the *accessory portal veins* described by Sappey; it is the communications they form with the **venous circle of the umbilicus* that are indicated in Fig. 1068. In obstruction of the portal circulation, this group of communicating veins forms one of the principal channels of collateral circulation, and it is their enlargement that constitutes the pathological condition known clinically as *caput medusæ*.

[274] *Subcutaneous Dorsal Veins of the Penis* (Ibid.).—As seen in Fig. 1068, these vessels are tributaries of the *external pudic veins* (see note [272] above). They must be carefully distinguished from the *dorsal vein of the penis* proper (see Fig. 1069, p. 672, and Fig. 1070, p. 673), which enters the pelvis and terminates in the *prostatic venous plexus*. See also note [275] below.

[275] *Vesical, Prostatic, and *Pudendal Venous Plexuses* (Fig. 1069, p. 672).—The *vesical venous plexus* consists of veins which ramify over the whole surface of the bladder external to its muscular coat; they are larger and more numerous round the base of the organ, receiving here veins from the ureters, the vasa deferentia, and the vesiculæ seminales, and communicating freely with the prostatic and hæmorrhoidal plexuses. The *prostatic venous plexus*, which is formed largely by the breaking up of the *dorsal vein of the penis*, ramifies between the two layers of the pelvi-prostatic capsule (see Appendix to Part IV., note [74]). Its connexion with the vesical plexus is so intimate that Macalister describes the two under a joint name as the *prostaticovesical plexus* (*op. cit.*, p. 428). In the female, the place of the prostatic plexus is taken by a plexus surrounding the upper part of the urethra and receiving the *dorsal vein of the clitoris;* the *vaginal plexus* also communicates freely with the vesical plexus in front and the hæmorrhoidal plexus behind. Thus, the **pudendal venous plexus* of Toldt (the term is little used in England) is made up in the male of veins regarded by English anatomists as belonging to the prostatic and vesical plexus; and in the female, of veins belonging to the peri-urethral, vesical, vaginal, and uterine plexuses. See Appendix to Part IV., note [105].

[276] (Fig. 1070, p. 673.) The *obturator fascia* (*parietal layer of the pelvic fascia*) has here split to form the channel for the internal pudic vessels, known as Alcock's canal. See Appendix, note [145].

[277] *Spermatic Vein* (Ibid.).—This is called by the author *vena spermatica interna* to distinguish it from the *vena spermatica externa*—the *cremasteric vein* of English anatomists. As a synonym for *vena spermatica interna*, the author employs the name *vena testicularis* in the male, and *vena ovarica* in the female.

[278] (Ibid.) An account of the anomalous origin of the *obturator artery* from the *deep* or *inferior epigastric artery* is given in note [1] to p. 388, in Part III. of this work.

[279] **Subcutaneous Venous Plexus of the Anus* (Fig. 1072, p. 675).—This name is not used by Quain or Macalister, but the latter authority speaks of the veins under consideration as "the system of *anal* (*proctodeal*) *veins*." The plexus consists of the terminal ramification of the branches of the *inferior* or *external hæmorrhoidal veins* (also called the *anal veins*, see note [150] above), and communicates freely within the anal canal with the *hæmorrhoidal* or *rectal venous plexus* (see Fig. 1073, p. 676), of which, indeed, the *anal venous plexus* is considered by English anatomists to form the lowest part.

[280] (Fig. 1073, p. 676.) English anatomists commonly include in the *hæmorrhoidal* or *rectal venous plexus* that which the author separately describes as the *subcutaneous venous plexus of the anus*. See Fig. 1072, p. 675, and note [279] above.

[281] *Uterovaginal Venous Plexus* (Ibid.).—English anatomists usually speak of separate *uterine* and *vaginal* venous plexuses. These plexuses, of course, communicate somewhat freely; but on the whole the venous blood from the body of the uterus passes by means of the *uterine plexus* to the *ovarian* or *pampiniform venous plexus* and the *inferior vena cava*, that from the neck of the uterus and from the vagina by means of the *vaginal plexus* to the *internal iliac vein*.

[282] **Nasofrontal Vein* (Fig. 1077, p. 682).—This name, which is not employed by Quain or by Macalister, is given by the author to the anterior extremity of the *superior ophthalmic vein*, which communicates with the *angular vein*.

[283] *Anterior, Posterior, and Common Facial Veins* (Ibid.).—It will be noticed that the author's name for the *facial vein* of English anatomists is *vena facialis anterior*, and the name *anterior facial vein* is occasionally used in England also to distinguish this vein from that which is sometimes called the *posterior facial vein* (*vena facialis posterior* of the author), but which is better known as the *temporomaxillary vein* (see Fig. 1077, p. 682). This latter is a short trunk, not infrequently plexiform, formed opposite the neck of the lower jaw by the union of the *temporal* and the *internal maxillary veins*. Near the angle of the jaw the temporomaxillary vein divides into two parts. The *anterior division* joins the *facial vein* to form a short trunk, the *vena facialis communis* of the author, sometimes known in England also as the *common facial vein* (see Fig. 1077); this opens into the internal jugular vein about the level of the hyoid bone. The *posterior division* of the *temporomaxillary vein* (called by Macalister the *communicating branch* from the temporomaxillary to the external jugular vein) unites with the *posterior auricular vein* to form the *external jugular vein*. (The arrangement shown in Fig. 1077 does not correspond fully to the above description, which is, however, that generally accepted as normal.)

[284] **Deltoid Veins* (Ibid.).—No English equivalent of the term *venæ deltoideæ*, used in Fig. 1077, is to be found in the works of Quain or Macalister. Examination of the figure shows that one of the veins thus denoted is the companion vein of one of the thoracic or pectoral branches of the acromiothoracic artery, while the other is a tributary of the cephalic vein.

[285] (Ibid.) Regarding the author's use of the term *superficial cervical artery*, see Appendix, notes [134], [135], [172], and [208]. The same

considerations apply to his use of the term *superficial cervical vein*.

[286] *Ranine Vein* (Fig. 1078, p. 683).—"The lingual artery is accompanied by two small *venæ comites*, but the largest vein of the tongue is the *ranine*, which lies external to the artery of the same name, and, after being joined by *sublingual branches*, passes backwards over the hyoglossus muscle with the hypoglossal nerve. These veins end in the internal jugular" (Ellis, "Demonstrations of Anatomy," 10th ed., p. 97). The *ranine vein*, called by the author, from its course adjacent to the hypoglossal nerve, *vena comitans nervi hypoglossi*, thus returns the greater part of the blood carried to the tongue by the *lingual artery* and its continuation the *ranine artery* (called by the author *arteria profunda linguæ*); but the vein and the nerve lie superficial to, while the artery lies beneath, the hyoglossus muscle.

[287] *Veins of the Temporomandibular Articulation* (Ibid.)—Among the tributaries of the *temporal vein*, Quain mentions "branches from a plexus which surrounds the articulation of the lower jaw, and into which one or two small veins issuing from the tympanum by the fissure of Glaser pour their contents," but he does not give these vessels any distinctive name.

[288] **Submaxillary Fossa* (Fig. 1079, p. 684).—The name of *fossa submaxillaris* is given by the author to the space between the superficial and deep layers of the deep cervical fascia, in which the submaxillary gland lies, bounded above by the lower margin of the mandible, below by the anterior belly of the digastric muscle, and behind by the stylomaxillary ligament. In Quain's terminology this region is the *submaxilliary triangle;* in Macalister's, it is the *anterior half* of the *digastric space*.

[289] *Supraclavicular Fossæ* (Ibid.).—In the terminology of English anatomists there is one *supraclavicular fossa* only, viz., the lower part of the posterior triangle of the neck. This, however, is called by the author **fossa supraclavicularis major*, the **greater supraclaviclular fossa;* while he gives the name of **fossa supraclavicularis minor*, the **lesser supraclaviclular fossa*, to the depression above the sternal extremity of the clavicle which corresponds to the interspace between the two heads of the sternocleidomastoid muscle.

[290] *Basilar Venous Plexus or Basilar Sinus* (Fig. 1080, p. 685).—This is sometimes also called the *transverse sinus*, but the name is better avoided, since the occipital portion of the *lateral sinus* is known in the Continental nomenclature as *sinus transversus* (see note [264] above). According to Von Langer and Toldt, the *basilar venous plexus* is to be regarded as an upward extension of the **anterior internal vertebral venous plexus* (see note [267] above), with which it communicates through the foramen magnum. On each side it opens into the *inferior petrosal sinus*. The *basilar venous plexus* must be carefully distinguished from the *basilar* or *basal vein*, *vena basalis* (*Rosenthali*). See Fig. 1086, p. 691, and note [297] below.

[291] *Rete Canalis Hypoglossi and Emissarium Canalis Hypoglossi* (Ibid.).—According to Quain (*op. cit.*, vol. ii., part ii., p. 526), "A venous ring surrounds the hypoglossal nerve in the anterior condylar foramen, and communicates internally with the occipital sinus and intraspinal veins, externally with the vertebral vein and the plexus on the front of the spine." Von Langer and Toldt describe as normal the existence of a venous network round the hypoglossal nerve, known as the **venous rete of the anterior condylar foramen*, and shown in the right side of Fig. 1080; a variety is the existence of a single, comparatively large, emissary vein in this situation, the **emissary vein of the anterior condylar foramen* (called by Macalister the *anterior condyloid vein*), shown in the left side of Fig. 1080. See also note [261] above.

[292] **Venous Rete of the Foramen Ovale* (Fig. 1082, p. 687).—This name is not used by Quain or Macalister, but the former, in his description of the emissary veins, writes (vol. ii., part ii., p. 526): "One or two considerable veins descend from the cavernous sinus through the foramen ovale, as well as small ones through the fibrous tissue in the foramen lacerum, to the pterygoid and pharyngeal plexuses. There is frequently another vein passing through the foramen of Vesalius."

[293] *Lacunæ Laterales* (Fig. 1083, p. 688).—"Communicating with the superior longitudinal sinus from its anterior end as far back as the beginning of the occipital region are a number of diverticula, from 0·5 to 3 cm. long, which form a series of venous lacunæ (*lacunæ laterales* of Key and Retzius) receiving the independent meningeal veins, and some veins from the diploë, and are invaginated by Pacchionian granulations. These venous lacunæ are not entirely confined to the region of the superior sinus, but some may occur in the neighbourhood of other sinuses, especially the lateral and straight sinus" (Quain, *op. cit.*, vol. iii., part i., p. 184).

[294] (Fig. 1084, p. 689.) The *superior thyroid vein* sometimes opens directly into the *internal jugular vein*, sometimes, as in the specimen shown in Fig. 1084, into the *common facial vein*. Regarding the last-named vein, see note [283] above.

[295] *Palatine Veins* (Ibid.).—Quain describes two palatine veins, a *superior palatine vein*, which enters the *pterygoid venous plexus*, and an *inferior palatine vein*, which returns the blood from a plexus surrounding the tonsil and from the soft palate, runs downwards beside the pharynx, and opens usually into the *facial vein* near to its proximal extremity. The *inferior palatine vein* of Quain is the vein called *vena palatina* in the author's terminology. The *sphenopalatine vein* (the companion vein of the nasal or sphenopalatine artery), like the superior palatine vein, joins the pterygoid venous plexus.

[296] *Arachnoidal Villi or Pacchionian Bodies* (Fig. 1085, p. 690).—The nature of these bodies having long remained uncertain, they are variously known as *Pacchionian bodies* (*corpora Pacchionii*), *Pacchionian glands* (*glandulæ Pacchionii*), and *Pacchionian granulations* (*granulationes Pacchionii*); Luschka, however, has shown conclusively that they are really enlarged *arachnoidal villi*.

[297] *Basilar or Basal Vein* (*Vena Basalis Rosenthali*) (Fig. 1086, p. 691).—This vein, which winds backwards round the crus cerebri to open into the *vein of Galen* just before it unites with its fellow, forms an anastomotic communication between that vein and the small veins of the base of the brain, and is formed by the confluence of some of these latter, viz., the *anterior cerebral vein*, the *deep Sylvian vein*, and the *inferior striate veins*. It must not be confused with the *basilar venous plexus* or *basilar sinus*, which is shown in Fig. 1080, p. 685, and described in note [290] above.

[298] *Veins of the Spinal Cord* (Ibid.).—Both Quain and Macalister speak generally of the *veins of the spinal cord* without any attempt at further precision in their nomenclature. According to Von Langer and Toldt (*op. cit.*, p. 599), "the *veins of the spinal cord* are arranged in two sets: a *superficial* set, *venæ spinales externæ* (the *external spinal veins*), which, like the arteries, run on the anterior and posterior surfaces, respectively, of the spinal cord: *venæ spinales externæ anteriores et posteriores* (*anterior* and *posterior external spinal veins*); and a *deep* set, *venæ spinales internæ* (the *internal spinal veins*), which are situate within the substance of the spinal cord in the neighbourhood of the central canal. The two sets communicate by horizontal branches; and other horizontal branches, running along the roots of the spinal nerves, connect the *external spinal veins* with the *internal vertebral venous plexuses*. (See note [259] above.)

[299] *Deep Median Vein* (Fig. 1087, p. 694).—The author, in the original German edition of this work, calls the *deep median vein* "the communicating branch between the superficial and the deep veins (*ramus anastomoticus*)." Macalister calls it *vena mediana profunda.*

[300] **Intercapitular Veins* (Fig. 1088, p. 695).—"The palmar veins of all the fingers [*palmar digital veins*] are connected in the interdigital folds by a transverse chain of anastomoses; from each anastomotic loop a short venous trunk, the *vena intercapitularis*, passes backwards to the veins of the dorsum of the hand, and these trunks convey by far the greater portion of the blood from the palmar digital veins" (Von Langer and Toldt, *op. cit.*, p. 548).

[301] *Palmar Digital Veins* (Ibid.).—As in the case of the *palmar digital arteries* (see Appendix, note [213]), the author distinguishes between the *venæ digitales volares propriæ* (*proper palmar digital veins*—see Fig. 1088, p. 695), which are situate on the palmar surfaces of the fingers themselves, and the *venæ digitales volares communes* (*common palmar digital veins*—see Fig. 1093, p. 700), which convey along the palmar surface of the metacarpus from the base of the fingers to the *superficial palmar venous arch* that portion of the blood that is not carried to the dorsum of the hand by the **intercapitular veins* (see note [300] above).

[302] **Dorsal Metacarpal Veins, etc.* (Fig. 1089, p. 696).—In Quain's "Anatomy," and to a lesser extent also in Macalister's "Anatomy," the description and therefore the nomenclature of the venous system, especially as regards the veins of the extremities, is less full and less precise than that of Von Langer and Toldt, whose terminology is used in this Atlas. In the case of the *dorsal metacarpal veins*, and in several other instances, I have therefore given a literal translation of the Latin names used by the author.

[303] **Accessory Cephalic Vein* (Ibid.).—"The name *vena cephalica accessoria* is given to a vein, often of considerable size, which is mainly a continuation of the **fourth dorsal metacarpal vein* [see note [302] above]; this vessel crosses the back of the forearm obliquely, running upwards and outwards to join the *radial vein* in the upper part of the forearm, or the *cephalic vein* just above the bend of the elbow" (Von Langer and Toldt, *op. cit.*, p. 549).

[304] *Dorsal Venous Rete (or Plexus) of the Hand* (Ibid.).—Macalister describes this plexus as consisting of two parts: "*The internal dorsal plexus* is formed by the union of a vein from the little finger [*vena Salvatella*] with veins from the third and fourth interdigital cleft. The *external dorsal plexus* is formed by the junction of a vein from the thumb [*vena cephalica pollicis*] with veins from the index and middle fingers" (*op. cit.*, p. 278).

[305] *Cephalic and Radial Veins* (Fig. 1090, p. 697).—According to the English nomenclature, the *radial vein* begins in the outer part of the *dorsal venous plexus of the hand*, runs upwards along the outer side of the forearm to join the *median cephalic vein* a little above the elbow, in the outer bicipital groove; the trunk formed by the confluence of these vessels is in England known as the *cephalic vein*. The author gives the name of *vena cephalica* both to the *radial* and to the *cephalic veins* of English anatomists; he sometimes, however, distinguishes the former as *vena cephalica* (*antibrachii*), and the latter as *vena cephalica* (*humeri*).

[306] *Basilic and Ulnar Veins* (Ibid.).—The *anterior* and *posterior ulnar veins* of English anatomists (*anterior* and *posterior superficial ulnar veins*, according to Macalister), the former commencing on the hypothenar eminence and running upwards along the ulnar side of the front of the forearm, and the latter commencing in the inner part of the *dorsal venous plexus of the hand* and running upwards along the ulnar side of the back of the forearm, unite as a rule a little below the elbow, the common trunk passing in front of the internal condyle to the inner bicipital groove, where by its confluence with the *median basilic vein* it forms the *basilic vein*. The author gives the name of *vena basilica* both to the *anterior ulnar* and to the *basilic veins* of English anatomists; he sometimes, however, distinguishes the former as *vena basilica* (*antibrachii*), and the latter as *vena basilica* (*humeri*).

[307] **Capital Vein of the Arm* (Ibid.).—Macalister, at the conclusion of his description of the superficial veins of the upper limb, writes (*op. cit.*, p. 278): "These veins are variable in relative size and arrangement. The basilic is the stem towards which all at first converged, and the radial originally crossed from without at the elbow to join it, receiving in its course the median and a descending branch from the outer bicipital sulcus. The adult form of the cephalic vein is a secondary development due to the dilatation of a communication between the uppermost radicle of this descending vein, and one of the thoracicohumeral veins. Intermediate forms are common." The arrangement of veins shown in the left-hand specimen of Fig. 1090 is obviously an example of the persistence of the primitive arrangement above described, the vein called *vena capitalis brachii* being really the *basilic vein*.

[308] **Median Vein of the Elbow* (Ibid.).—The arrangement of the veins in front of the elbow usually described as normal is for the *median vein*, after receiving the *deep median vein*, to divide into *median basilic* and *median cephalic branches*, as shown in the right-hand specimen in Fig. 1090. Nearly, if not quite, as common is the arrangement shown in the middle specimen of that figure, in which the *median vein* deviates to the ulnar side of the forearm and joins the anterior ulnar vein, while the radial vein divides well below the elbow into an outer branch, the *cephalic vein*, and an inner branch, called by the author *vena mediana cubiti*, which runs inwards and upwards across the flexure of the elbow, receiving in its course the *deep median vein*, and uniting with the trunk formed by the confluence of the *median* and *ulnar veins* to form the *basilic vein*. This is one of the "intermediate forms" alluded to by Macalister (see note [307] above), and the **median vein of the elbow* in this arrangement is the representative of the *median basilic vein* in the arrangement usually described as normal. Sometimes, though the *median vein* divides in "normal" fashion into *median basilic* and *median cephalic branches*, still, an anastomotic branch, parallel with the *median basilic vein* and a little above it, passes across the front of the elbow from the *radial* or the *cephalic* vein to the basilic vein. This vein, when present, is called by the author **vena mediana cubiti accessoria*, the accessory median vein of the elbow (see Fig. 1087, p. 694, and Fig. 1089, p. 696).

[309] (Fig. 1091, p. 698.) Regarding the nomenclature of this terminal portion of the *subscapular artery*, see note [136] above. The same considerations apply to the nomenclature of the companion vein.

[310] (Ibid.) This is the trunk formed by the union of the *anterior* and *posterior ulnar veins* (*anterior* and *posterior superficial ulnar veins*, according to Macalister). See note [306] above.

[311] *Deep Median Vein* (Ibid.).—The author, in the original German edition of this work, calls the *deep median vein* "communicating branch between the [deep] radial veins and the superficial veins (ramus anastomoticus)." Macalister calls it *vena mediana profunda.*

[312] *Perforating Arteries* (Fig. 1099, p. 705).—Usually the *perforating arteries* are *four* in number, the *first*, *second*, and *third*, or *superior*, *middle*, and *inferior perforating arteries*, being branches of the *deep femoral* or *profunda artery*, while the terminal portion of

the *profunda*, which perforates the adductor magnus muscle in series with the branches just mentioned, constitutes the *fourth perforating artery*. In the specimen shown in Fig. 1099, however, there are apparently *three* perforating arteries only, the terminal portion of the *deep femoral* or *profunda artery* constituting the *third* of the series. (This is the arrangement described as normal by Von Langer and Toldt.)

313 **Femoropopliteal Vein* (Fig. 1102, p. 708).—"As the *external* or *short saphenous vein* enters the popliteal space, it is joined by an anastomotic cutaneous vein from the back of the thigh, **vena femoropoplitea*, which runs beside the small sciatic nerve for some distance, and communicates with the lowest *perforating vein*; finally the *external saphenous vein* enters the *popliteal vein*. Not infrequently, however, the **femoropopliteal vein* forms the true upward continuation of the *external saphenous vein*, so that the latter is connected with the popliteal vein only by a relatively small communicating branch, while it terminates in the *deep femoral* or *profunda vein* through the intermediation of the lowest *perforating vein*" (Von Langer and Toldt, *op. cit.*, pp. 552, 553). This variety is described by Quain (*op. cit.*, vol. ii., part ii., p. 536), but the name **femoropopliteal vein* is not used by this author. Another fairly common variety is an enlargement of the communicating branch between the *external* and the *internal saphenous veins*, so that the former vein empties itself chiefly or entirely into the latter.

314 *Lumbar and Aortic Lymphatic Glands and Plexuses* (Fig. 1113, p. 718).—Quain does not speak of *aortic lymphatic glands* and *plexus*, but divides the *lumbar glands* into three groups, two *lateral* and one *median*, which correspond roughly with the *lumbar* and *aortic* glands respectively of Toldt. Macalister's terminology, however, resembles that of the German author, for according to the former (*op. cit.*, p. 432) the *lumbar lymphatic plexuses* "are united across the aorta by a median *aortic lymphatic plexus*, with about six glands in its course."

315 *Submaxillary and Suprahyoid or Submental Lymphatic Glands* (Fig. 1115, p. 720).—"The lymphatic glands situate along the lower border of the inferior maxillary bone and on the surface of the submaxillary (salivary) gland, known as *lymphoglandulæ submaxillares*, receive the lymphatic vessels from the face that run beside the facial vein, and also those from the lower gums, the floor of the mouth, and the isthmus of the fauces. One or two glands, situate between the anterior bellies of the digastric muscles, and known as *lymphoglandulæ submentales*, receive the lymphatic vessels of the chin" (Von Langer and Toldt, *op. cit.*, p. 566). The last-named are apparently identical with those called by Sappey the *suprahyoid glands*, one or two small glands "placed in the centre of the neck between the anterior bellies of the two digastric muscles, and connected with the lymphatics descending from the lower lip" (Quain, *op. cit.*, vol. ii., part ii., p. 558).

316 (Fig. 1116, p. 721.) As the author recognises *two* mediastina only, *anterior* and *posterior* (see Appendix to Part IV., note [24]), the lymphatic glands called by him *lymphoglandulæ mediastinales anteriores* comprise the *superior mediastinal* or *cardiac lymphatic glands* in addition to the *anterior mediastinal lymphatic glands* of English authors (see also note [3] to p. 482, in Part IV.).

317 *Anterior Auricular and Parotid Lymphatic Glands* (Ibid.).—Writing of the *parotid lymphatic glands*, Quain states (*op. cit.*, vol. ii., part ii., p. 558) that they are "three or four, of small size . . . beneath the parotid fascia, and . . . frequently more or less embedded in the substance of the parotid gland; one, larger than the others, is situated immediately in front of the tragus of the ear." It is thus evident that the glands called by Toldt *lymphoglandulæ auriculares anteriores* are included by Quain among the *parotid lymphatic glands*.

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TO THE

ANGEIOLOGY

INDEX

TO THE ANGEIOLOGY

Certain names in this Index have an asterisk (*) prefixed; these, as more fully explained in the Translator's Preface, being terms that form part of the English nomenclature used in this work, but which are not commonly employed by English anatomists. To other names a dagger (†) is prefixed; these are Latin names used by the author in the original work, but not included in the official nomenclature of the "Anatomische Gesellschaft." Abbreviation. App.= Appendix.

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AN ATLAS

OF

HUMAN ANATOMY

FOR STUDENTS AND PHYSICIANS

BY

CARL TOLDT, M.D.

ASSISTED BY

PROFESSOR ALOIS DALLA ROSA, M.D.

Adapted to English and American and International Terminology

BY

M. EDEN PAUL, M.D. Brux., M.R.C.S., L.R.C.P.

SIXTH SECTION

G. NEUROLOGY
H. THE ORGANS OF THE SENSES

(FIGURES 1124 TO 1505 AND INDEX)

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NEUROLOGIA

NEUROLOGY

NEUROLOGY—GENERAL CONSIDERATIONS

FIG. 1124.—MEDULLATED NERVE FIBRES,[3] FROM A PERIPHERAL NERVE TEASED OUT IN NORMAL SALT SOLUTION.

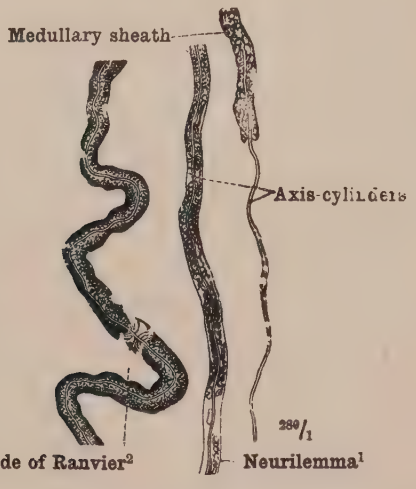


FIG. 1125.—MEDULLATED NERVE FIBRES[3]; THE AXIS-CYLINDER HAS BEEN RENDERED VISIBLE BY TREATMENT WITH MÜLLER'S FLUID.

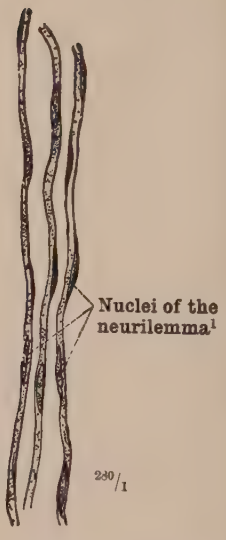


FIG. 1126.—NON-MEDULLATED NERVE FIBRES[3] INVESTED WITH NEURILEMMA (*see Appendix, note* [318]), FROM THE CORD OF THE SYMPATHETIC NERVE.

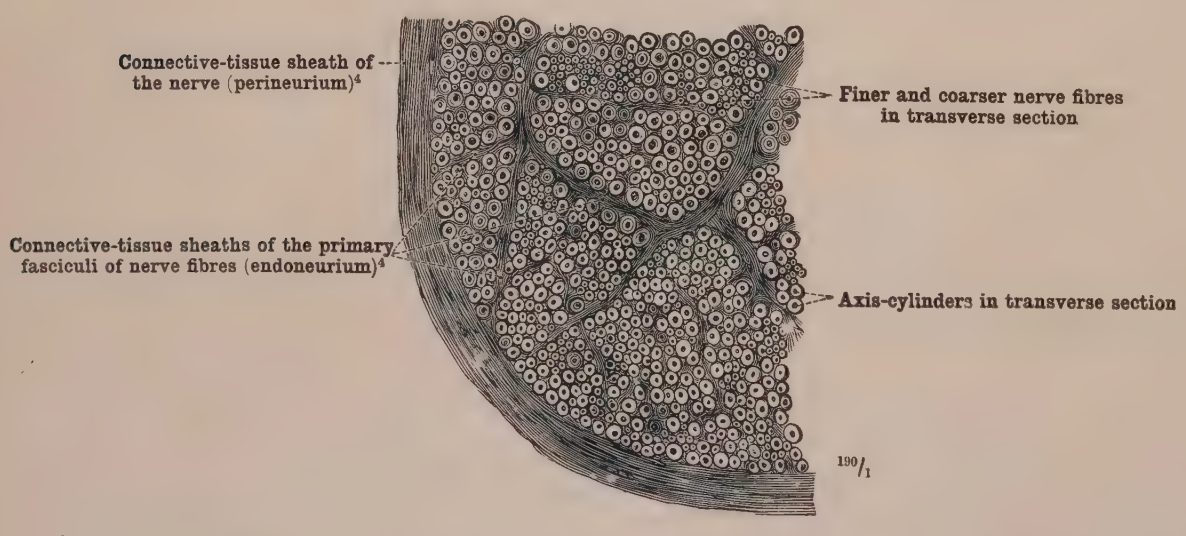

Connective-tissue sheath of the nerve (perineurium)[4]
Finer and coarser nerve fibres in transverse section
Connective-tissue sheaths of the primary fasciculi of nerve fibres (endoneurium)[4]
Axis-cylinders in transverse section
190/1

FIG. 1127.—TRANSVERSE SECTION OF A PORTION OF THE HUMAN MEDIAN NERVE. (*See Appendix, conclusion of note* [320].)

[1] See Appendix, note [318].
[2] Quain gives *constriction* (*of Ranvier*) as an alternative name for the *node of Ranvier*, but the latter term is that in general use.—TR.
[3] See Appendix, note [319].
[4] See Appendix, note [320].

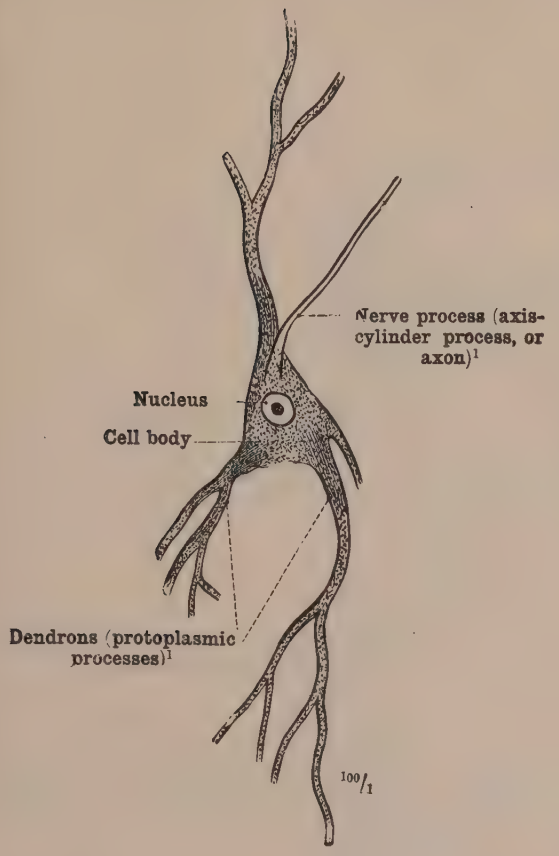


FIG. 1128.—MOTOR NERVE CELL FROM THE ANTERIOR COLUMN OF THE HUMAN SPINAL CORD.

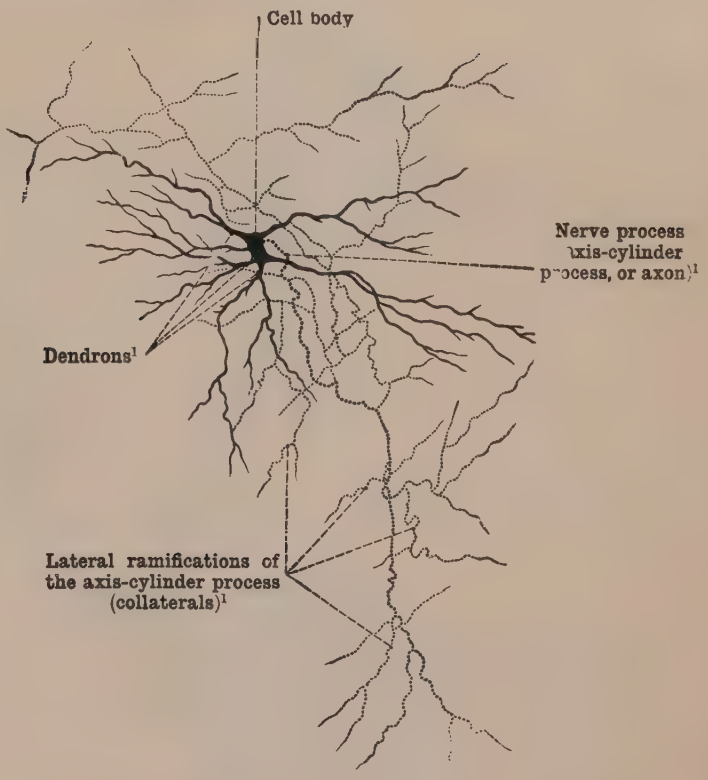

Cell body
Nerve process (axis-cylinder process, or axon)[1]
Dendrons[1]
Lateral ramifications of the axis-cylinder process (collaterals)[1]

FIG. 1129.—TYPE OF SENSORY NERVE CELL (AFTER GOLGI).

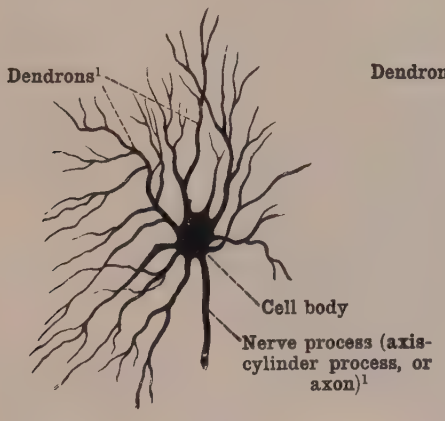


FIG. 1130.—GANGLION CELLS FROM THE SYMPATHETIC NERVOUS SYSTEM.

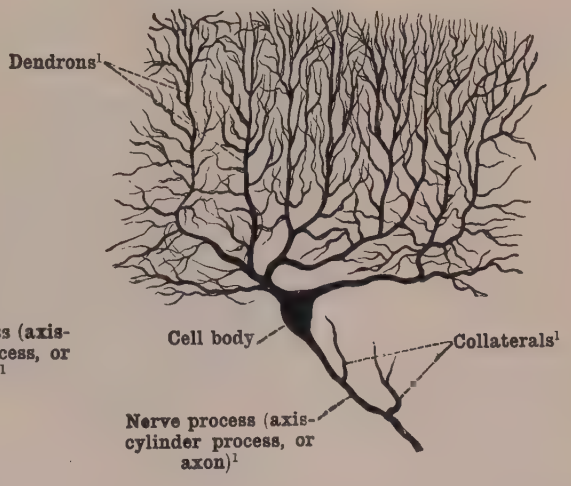


FIG. 1131.—CELL OR CORPUSCLE OF PURKINJE FROM THE HUMAN CEREBELLUM (AFTER GOLGI).

[1] See Appendix, note [321].

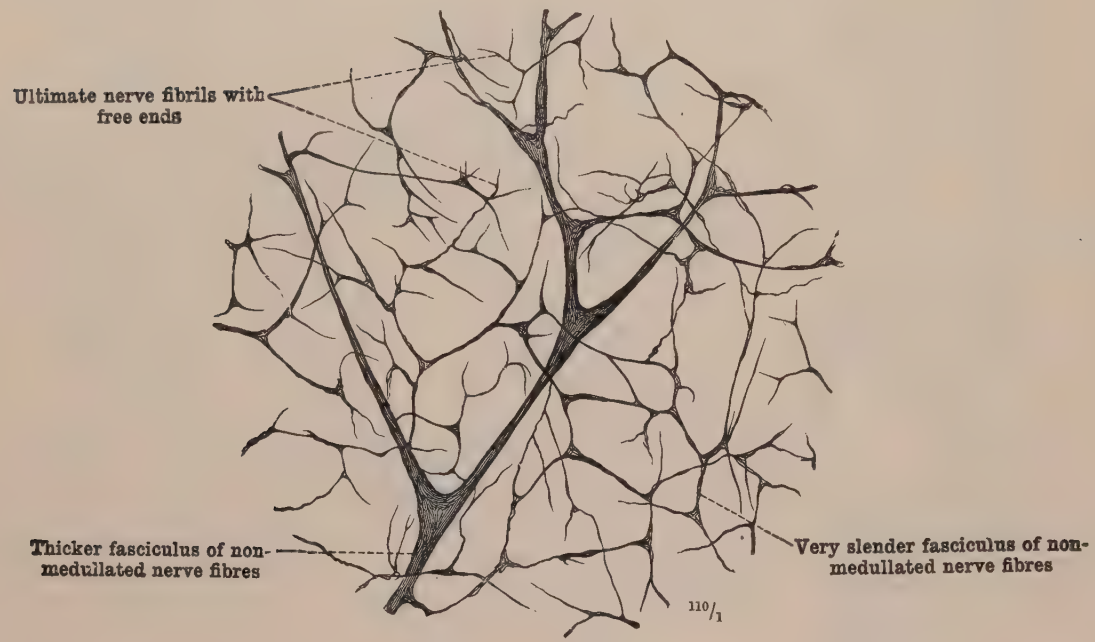

Ultimate nerve fibrils with free ends
Thicker fasciculus of non-medullated nerve fibres
Very slender fasciculus of non-medullated nerve fibres
110/1

FIG. 1132.—NERVES OF THE CORNEA, STAINED WITH CHLORIDE OF GOLD. PERIPHERAL TERMINAL NETWORK[1] OF SENSORY NERVES WITH ULTIMATE FIBRILS ENDING FREELY. THE PLANE OF THE NETWORK IS PARALLEL WITH THE SURFACE OF THE CORNEA.

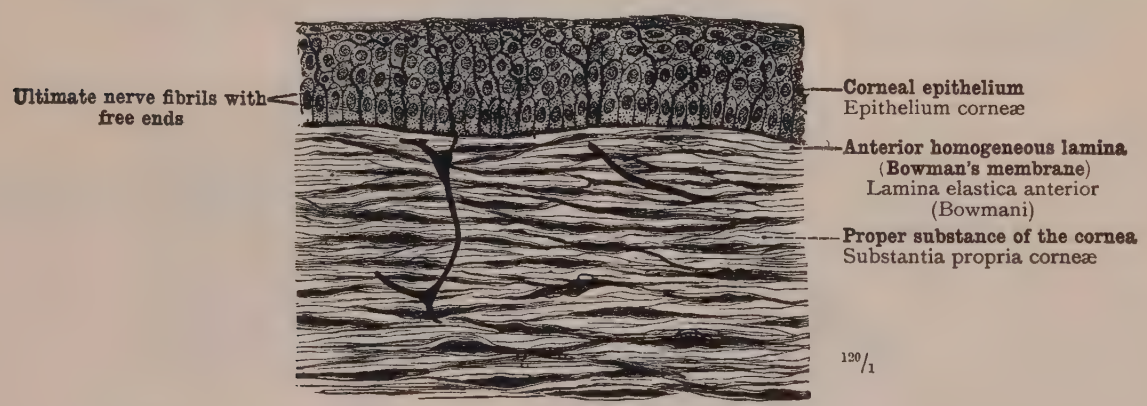


FIG. 1133.—NERVES OF THE CORNEA, STAINED WITH CHLORIDE OF GOLD. VERTICAL SECTION THROUGH THE ANTERIOR PORTION OF THE CORNEA. THE NERVE FIBRILS END FREELY IN THE EPITHELIUM.[2]

[1] See Appendix, note 322. [2] See Appendix, note 323.

Free Peripheral Ending of Sensory Nerve Fibres.

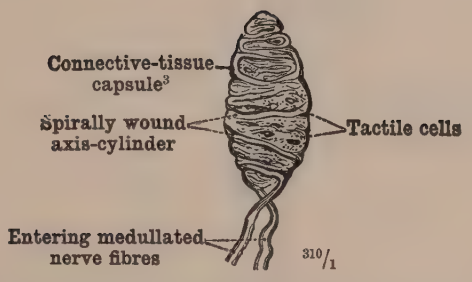


FIG. 1134.—TOUCH CORPUSCLE,[1] CORPUSCULUM TACTIS, FROM THE FINGER-TIP OF AN ADULT MAN.

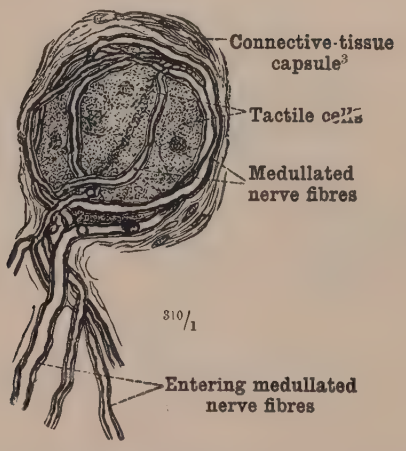


FIG. 1135.—SPHEROIDAL END-BULB OF KRAUSE, CORPUSCULUM BULBOIDEUM, FROM THE HUMAN CORNEA.

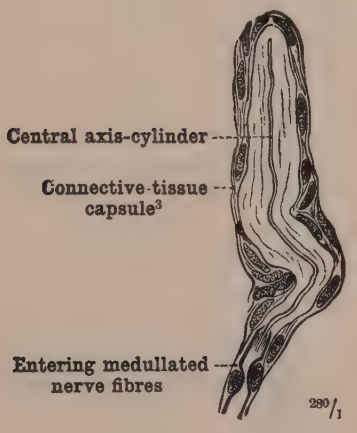


FIG. 1136.—CYLINDRICAL END-BULB FROM THE CONJUNCTIVA OF THE CALF.

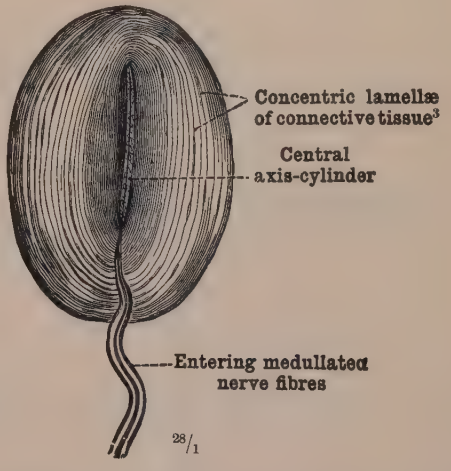


FIG. 1137.—PACINIAN CORPUSCLE,[2] CORPUSCULUM LAMELLOSUM, FROM THE MESOCOLON OF THE CAT.

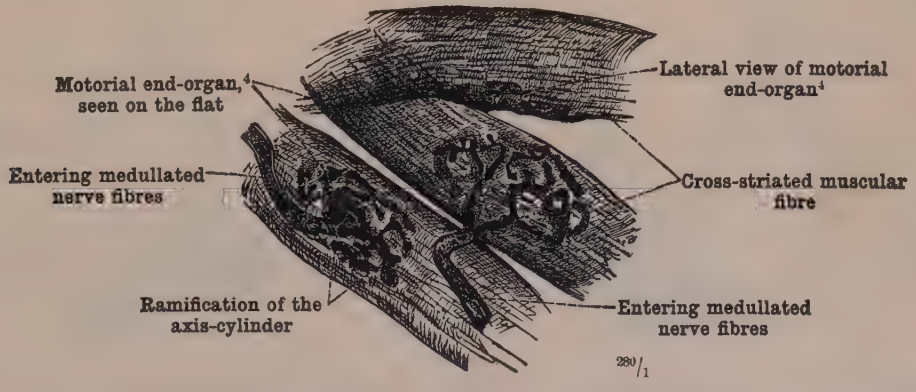


FIG. 1138.—TERMINATION OF MOTOR NERVE FIBRES IN CROSS-STRIATED MUSCULAR FIBRES.

1 See Appendix, note 324. 2 See Appendix, note 325. 3 See Appendix, note 326.
4 *Motorial End-Organ.*—The term *end-organ* is rightly preferred by Quain to the more familiar *end-plate*, this structure being, as the figure shows, not a continuous plate, but a flattened ramification.—TR.

Terminal corpuscles of sensory nerves, Corpuscula nervorum sensibilium terminalia.—Motorial end-organs (end-plates). (*See note 4 above.*)

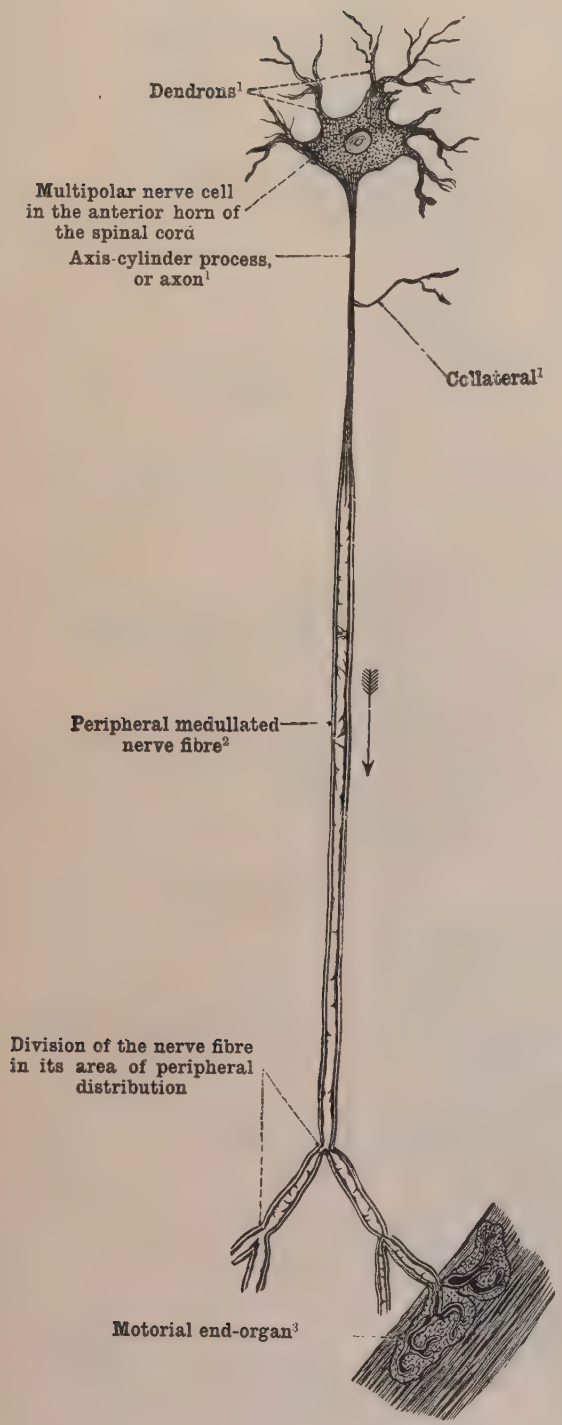

Dendrons[1]
Multipolar nerve cell in the anterior horn of the spinal cord
Axis-cylinder process, or axon[1]
Collateral[1]
Peripheral medullated nerve fibre[2]
Division of the nerve fibre in its area of peripheral distribution
Motorial end-organ[3]

FIG. 1139.—DIAGRAMMATIC REPRESENTATION OF THE ORIGIN, COURSE, AND PERIPHERAL DISTRIBUTION OF A MOTOR NERVE FIBRE.

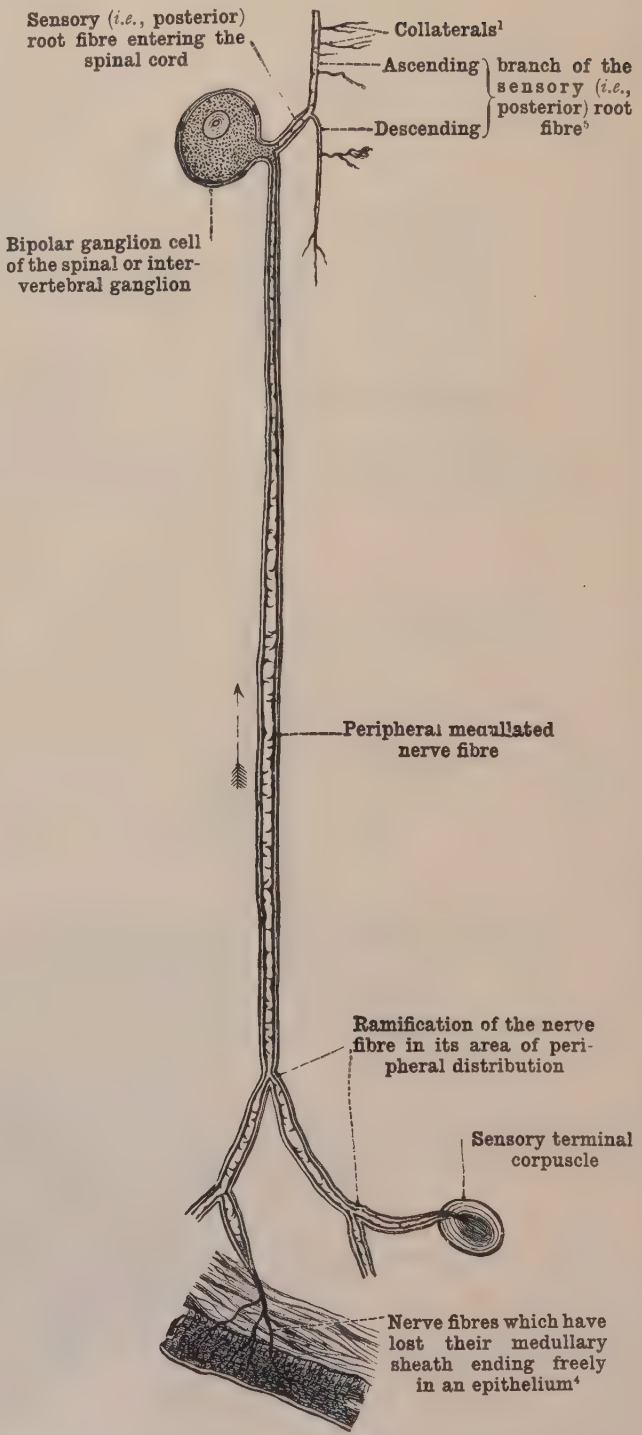

Sensory (i.e., posterior) root fibre entering the spinal cord
Collaterals[1]
Ascending
Descending
branch of the sensory (i.e., posterior) root fibre[5]
Bipolar ganglion cell of the spinal or inter-vertebral ganglion
Peripheral medullated nerve fibre
Ramification of the nerve fibre in its area of peripheral distribution
Sensory terminal corpuscle
Nerve fibres which have lost their medullary sheath ending freely in an epithelium[4]

FIG. 1140.—DIAGRAMMATIC REPRESENTATION OF THE ORIGIN, COURSE, AND PERIPHERAL DISTRIBUTION OF A SENSORY NERVE FIBRE.

In both figures the arrows indicate the direction in which the nervous impulse passes.

[1] See Appendix, note 321. [2] See Appendix, note 319. [3] See note 4 to p. 749. [4] See Appendix, note 323. [5] See note 9 to p. 755.

Origin and Termination of Nerve Fibres.

SYSTEMA NERVORUM CENTRALE

THE CENTRAL NERVOUS SYSTEM

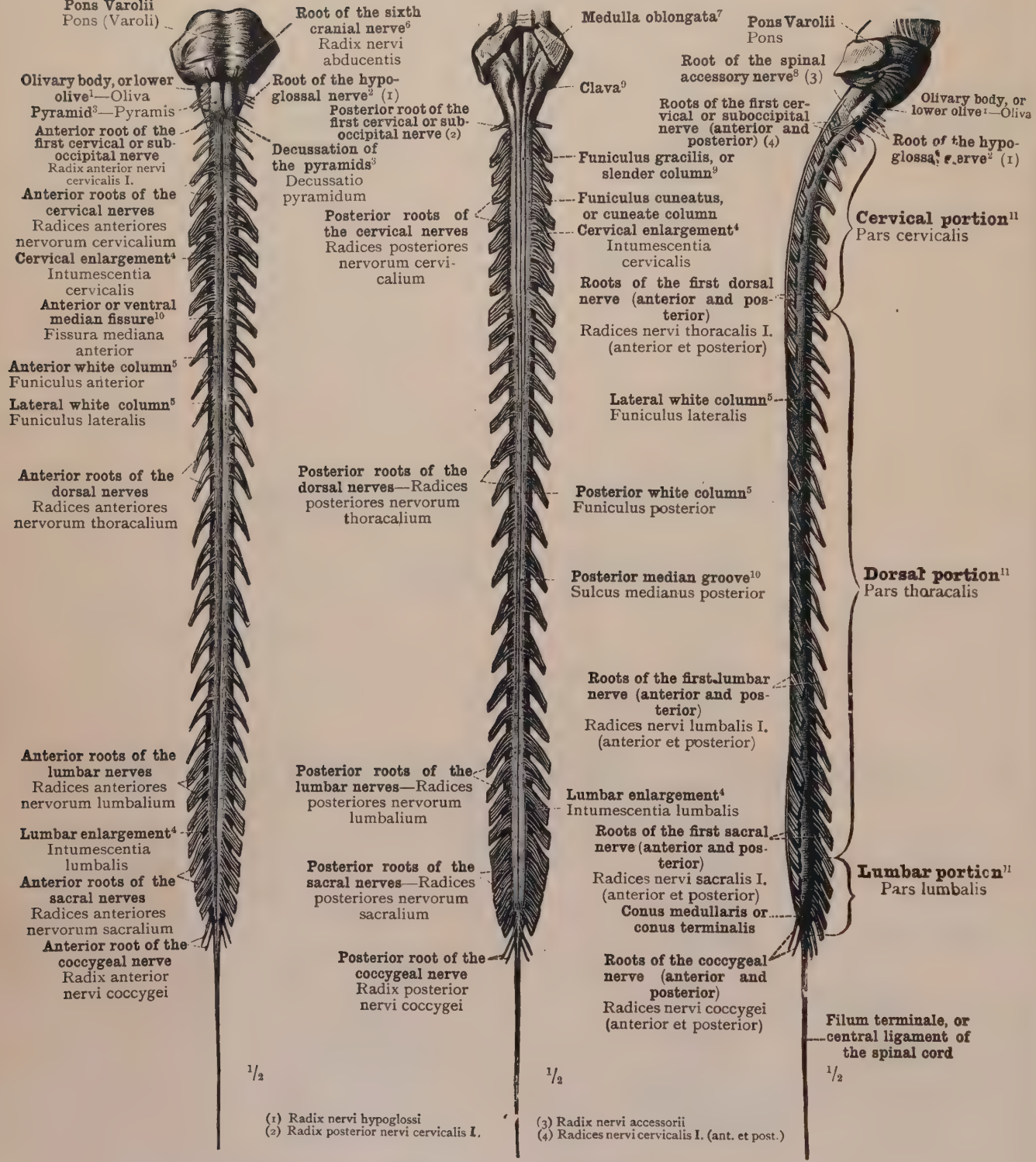

Pons Varolii
Pons (Varoli)
Olivary body, or lower olive[1]—Oliva
Pyramid[3]—Pyramis
Anterior root of the first cervical or sub-occipital nerve
Radix anterior nervi cervicalis I.
Anterior roots of the cervical nerves
Radices anteriores nervorum cervicalium
Cervical enlargement[4]
Intumescentia cervicalis
Anterior or ventral median fissure[10]
Fissura mediana anterior
Anterior white column[5]
Funiculus anterior
Lateral white column[5]
Funiculus lateralis
Anterior roots of the dorsal nerves
Radices anteriores nervorum thoracalium
Anterior roots of the lumbar nerves
Radices anteriores nervorum lumbalium
Lumbar enlargement[4]
Intumescentia lumbalis
Anterior roots of the sacral nerves
Radices anteriores nervorum sacralium
Anterior root of the coccygeal nerve
Radix anterior nervi coccygei
1/2
Root of the sixth cranial nerve[6]
Radix nervi abducentis
Root of the hypoglossal nerve[2] (1)
Posterior root of the first cervical or sub-occipital nerve (2)
Decussation of the pyramids[3]
Decussatio pyramidum
Posterior roots of the cervical nerves
Radices posteriores nervorum cervicalium
Posterior roots of the dorsal nerves—Radices posteriores nervorum thoracalium
Posterior roots of the lumbar nerves—Radices posteriores nervorum lumbalium
Posterior roots of the sacral nerves—Radices posteriores nervorum sacralium
Posterior root of the coccygeal nerve
Radix posterior nervi coccygei
1/2
(1) Radix nervi hypoglossi
(2) Radix posterior nervi cervicalis I.
Medulla oblongata[7]
Clava[9]
Funiculus gracilis, or slender column[9]
Funiculus cuneatus, or cuneate column
Cervical enlargement[4]
Intumescentia cervicalis
Roots of the first dorsal nerve (anterior and posterior)
Radices nervi thoracalis I. (anterior et posterior)
Lateral white column[5]
Funiculus lateralis
Posterior white column[5]
Funiculus posterior
Posterior median groove[10]
Sulcus medianus posterior
Roots of the first lumbar nerve (anterior and posterior)
Radices nervi lumbalis I. (anterior et posterior)
Lumbar enlargement[4]
Intumescentia lumbalis
Roots of the first sacral nerve (anterior and posterior)
Radices nervi sacralis I. (anterior et posterior)
Conus medullaris or conus terminalis
Roots of the coccygeal nerve (anterior and posterior)
Radices nervi coccygei (anterior et posterior)
1/2
(3) Radix nervi accessorii
(4) Radices nervi cervicalis I. (ant. et post.)
Pons Varolii
Pons
Root of the spinal accessory nerve[8] (3)
Roots of the first cervical or suboccipital nerve (anterior and posterior) (4)
Olivary body, or lower olive[1]—Oliva
Root of the hypoglossal nerve[2] (1)
Cervical portion[11]
Pars cervicalis
Dorsal portion[11]
Pars thoracalis
Lumbar portion[11]
Pars lumbalis
Filum terminale, or central ligament of the spinal cord
1/2

FIG. 1141.—SEEN FROM BEFORE.

FIG. 1142.—SEEN FROM BEHIND.

FIG. 1143.—SEEN FROM THE RIGHT SIDE.

1 See Appendix, note 327.
2 *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; sometimes also known as the *lingual motor nerve*.
3 See Appendix, note 328. 4 See Appendix, note 329. 5 See Appendix, note 330.
6 Known also as the *abducent ocular nerve*. 7 See Appendix, note 331.
8 *Tenth cranial nerve* in Soemmerring's enumeration, *accessory portion* of the *eighth cranial nerve* in that of Willis.
9 The *funiculi graciles* with their *clavæ* are sometimes described as the *posterior pyramids*.
10 See Appendix, note 332. 11 See Appendix, note 333.

Medulla spinalis—The spinal cord (*see Appendix, note* 334).

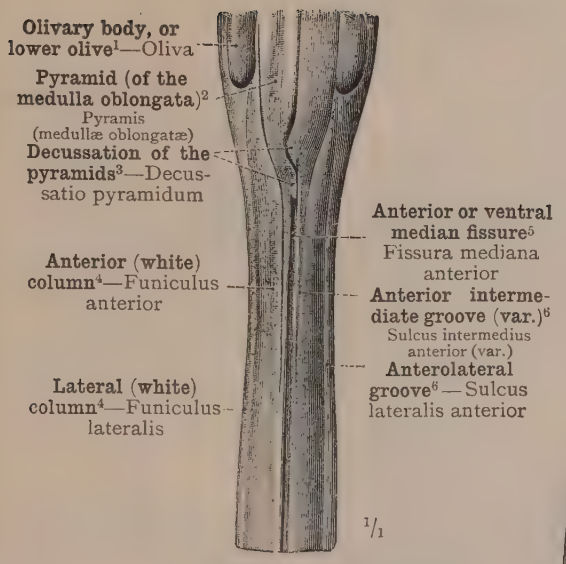


FIG. 1144.—THE CERVICAL PORTION OF THE SPINAL CORD, PARS CERVICALIS MEDULLÆ SPINALIS (*see Appendix, note* 333), WITH THE ADJOINING PORTION OF THE MEDULLA OBLONGATA, SEEN FROM BEFORE.

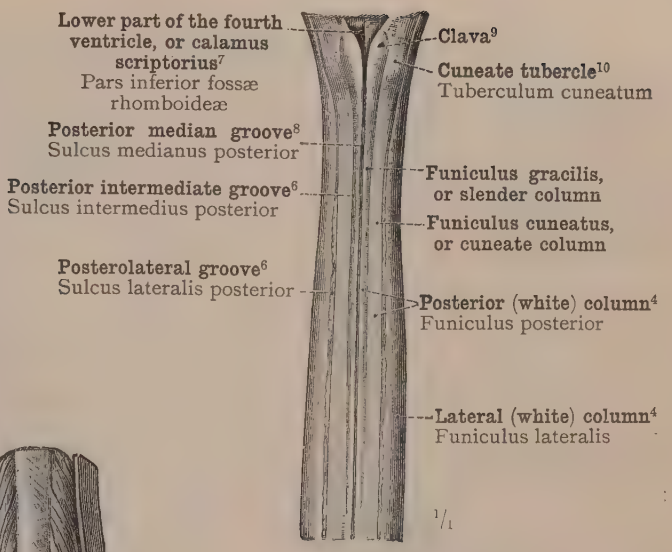


FIG. 1145.—THE CERVICAL PORTION OF THE SPINAL CORD, PARS CERVICALIS MEDULLÆ SPINALIS (*see Appendix, note* 333), WITH THE ADJOINING PORTION OF THE MEDULLA OBLONGATA, SEEN FROM BEHIND.

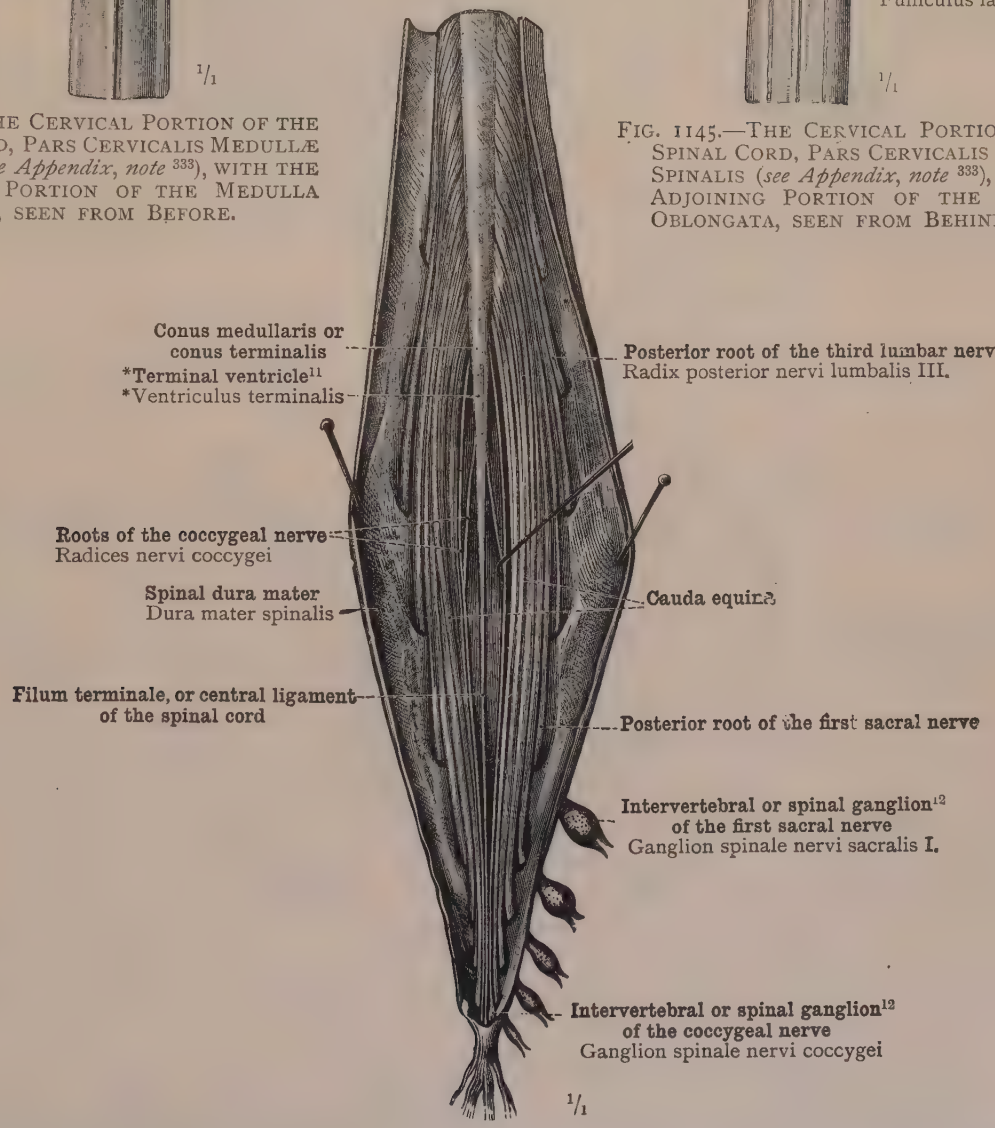
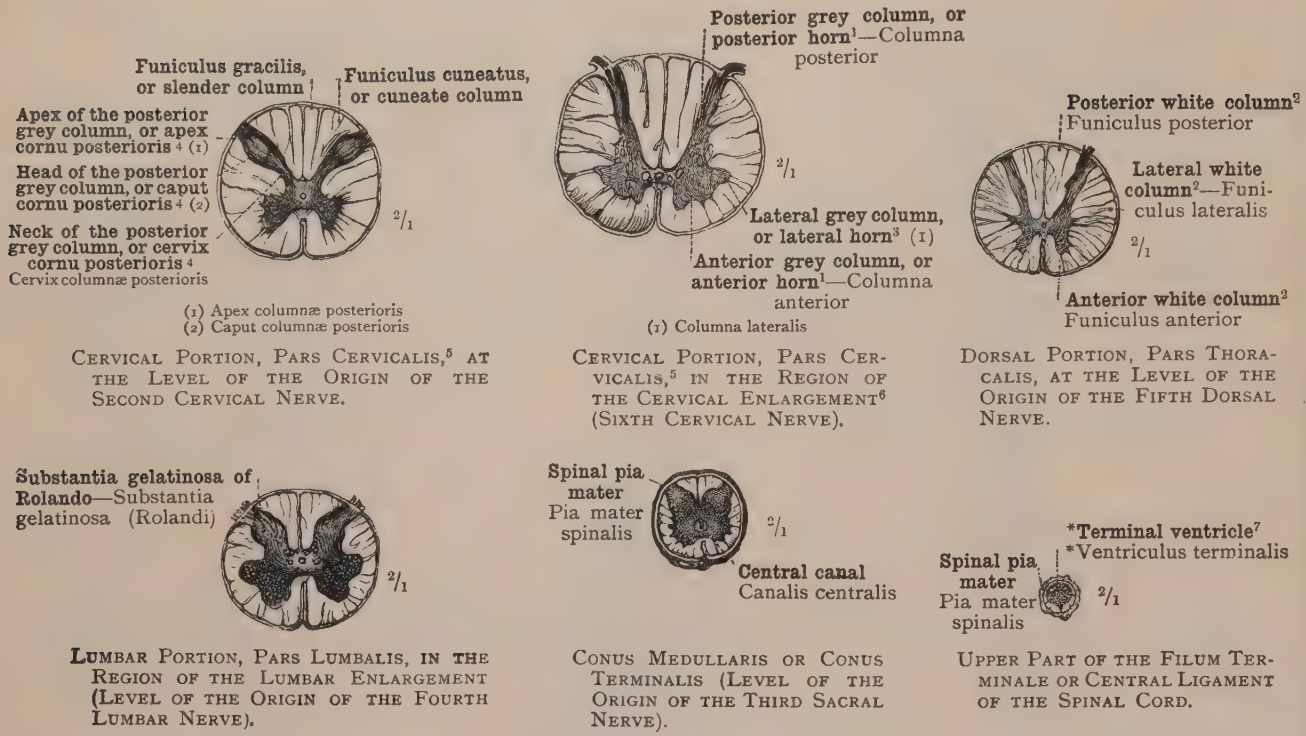

Conus medullaris or conus terminalis
*Terminal ventricle[11]
*Ventriculus terminalis
Posterior root of the third lumbar nerve
Radix posterior nervi lumbalis III.
Roots of the coccygeal nerve
Radices nervi coccygei
Spinal dura mater
Dura mater spinalis
Cauda equina
Filum terminale, or central ligament of the spinal cord
Posterior root of the first sacral nerve
Intervertebral or spinal ganglion[12] of the first sacral nerve
Ganglion spinale nervi sacralis I.
Intervertebral or spinal ganglion[12] of the coccygeal nerve
Ganglion spinale nervi coccygei
1/1

FIG. 1146.—THE LUMBAR PORTION OF THE SPINAL CORD, PARS LUMBALIS MEDULLÆ SPINALIS (*see Appendix, note* 333), WITH THE CONUS MEDULLARIS (OR CONUS TERMINALIS), THE FILUM TERMINALE (OR CENTRAL LIGAMENT OF THE SPINAL CORD), AND THE CAUDA EQUINA. SEEN FROM BEHIND.

[1] See Appendix, note 327.
[2] The words *medullæ oblongatæ* are added to distinguish the *pyramid of the medulla oblongata* from the *pyramis vermis*, the *pyramid of the lower worm of the cerebellum*. See also Appendix, note 328.
[3] See Appendix, note 328. [4] See Appendix, note 330. [5] See Appendix, note 332. [6] See Appendix, note 335.
[7] See Appendix, note 336. [8] See Appendix, note 332. [9] See note [9] to p. 752. [10] See Appendix, note 337.
[11] See Appendix, note 338. [12] Also called the *ganglion of the posterior root.*

Medulla spinalis—The spinal cord (*see Appendix, note* 334).



CERVICAL PORTION, PARS CERVICALIS,[5] AT THE LEVEL OF THE ORIGIN OF THE SECOND CERVICAL NERVE.

CERVICAL PORTION, PARS CERVICALIS,[5] IN THE REGION OF THE CERVICAL ENLARGEMENT[6] (SIXTH CERVICAL NERVE).

DORSAL PORTION, PARS THORACALIS, AT THE LEVEL OF THE ORIGIN OF THE FIFTH DORSAL NERVE.

LUMBAR PORTION, PARS LUMBALIS, IN THE REGION OF THE LUMBAR ENLARGEMENT (LEVEL OF THE ORIGIN OF THE FOURTH LUMBAR NERVE).

CONUS MEDULLARIS OR CONUS TERMINALIS (LEVEL OF THE ORIGIN OF THE THIRD SACRAL NERVE).

UPPER PART OF THE FILUM TERMINALE OR CENTRAL LIGAMENT OF THE SPINAL CORD.

FIG. 1147.—TRANSVERSE SECTIONS OF THE SPINAL CORD OF AN ADULT MAN.

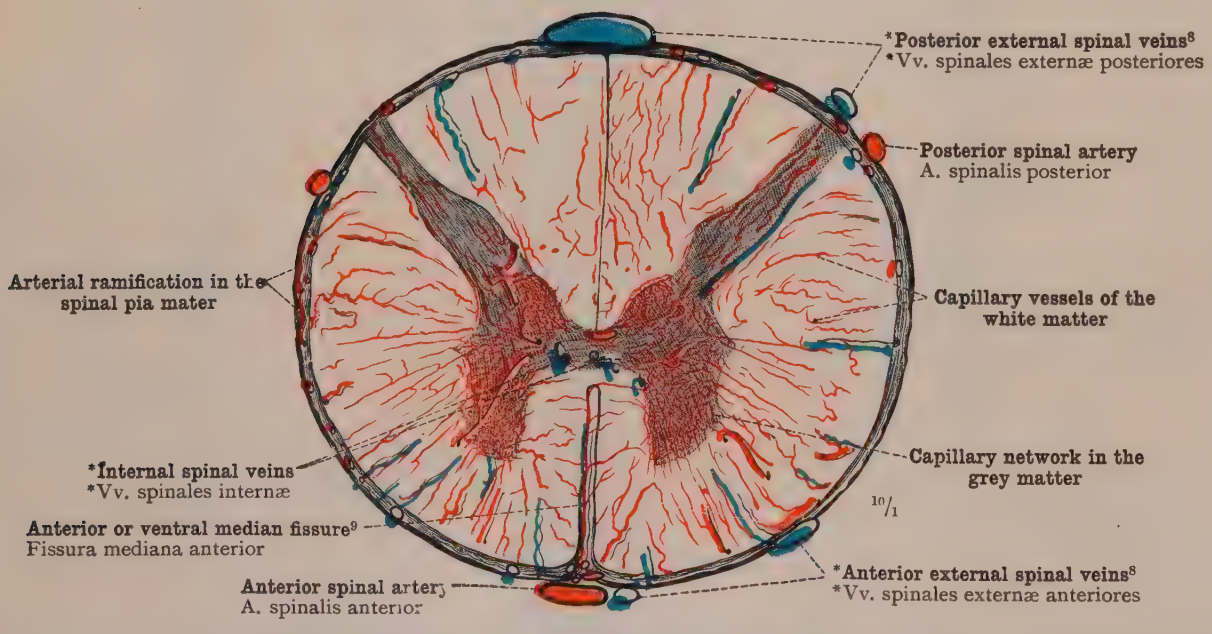


FIG. 1148.—THE BLOOD-SUPPLY OF THE SPINAL CORD. TRANSVERSE SECTION THROUGH THE LOWER END OF THE DORSAL PORTION (PARS THORACALIS)[6].

1 See Appendix, note 339. 2 See Appendix, note 330.
3 Better known as the *intermediolateral tract* of Lockhart Clarke (*intermediate process* of Gowers). Regarding the use of the term *lateral grey column*, see Appendix, note 339.
4 The *posterior horn* consists of three parts: the *cervix*, the narrow base; the *caput*, the thickened main portion; and the *apex*, the thin posterior extremity just beneath the posterolateral groove. Regarding the use of the term *posterior grey column*, see Appendix, note 339.
5 See Appendix, note 333. 6 See Appendix, note 329. 7 See Appendix, note 338.
8 See Appendix, note 340. 9 See Appendix, note 332.

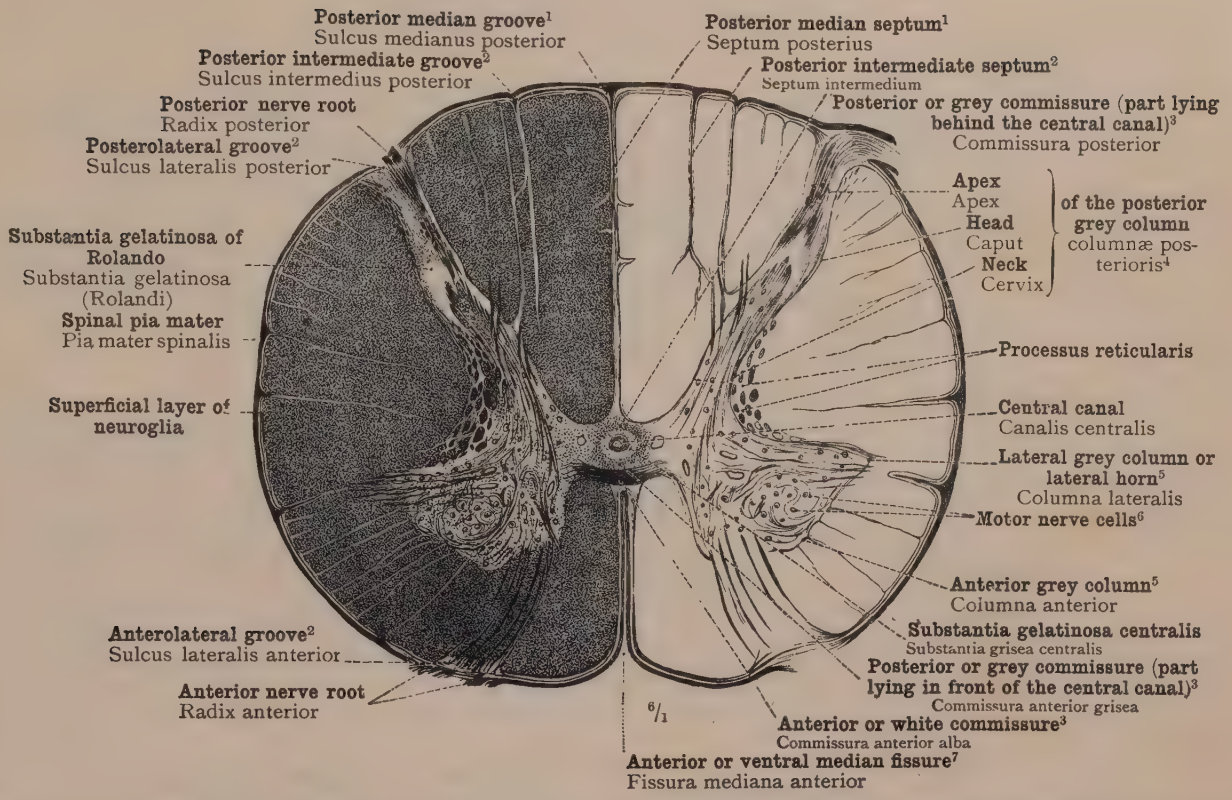


FIG. 1149.—TRANSVERSE SECTION THROUGH THE CERVICAL ENLARGEMENT, INTUMESCENTIA CERVICALIS,[8] OF THE SPINAL CORD, AT THE LEVEL OF THE EMERGENCE OF THE ROOTS OF THE SIXTH CERVICAL NERVE.

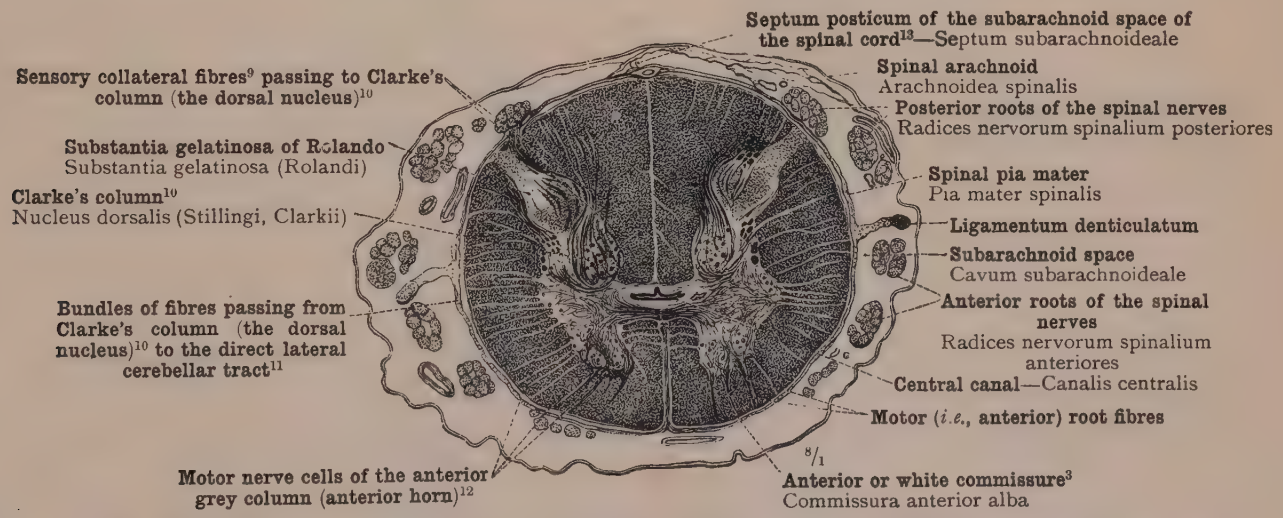

Septum posticum of the subarachnoid space of the spinal cord[13]—Septum subarachnoideale
Sensory collateral fibres[9] passing to Clarke's column (the dorsal nucleus)[10]
Spinal arachnoid
Arachnoidea spinalis
Posterior roots of the spinal nerves
Radices nervorum spinalium posteriores
Substantia gelatinosa of Rolando
Substantia gelatinosa (Rolandi)
Spinal pia mater
Pia mater spinalis
Clarke's column[10]
Nucleus dorsalis (Stillingi, Clarkii)
Ligamentum denticulatum
Subarachnoid space
Cavum subarachnoideale
Bundles of fibres passing from Clarke's column (the dorsal nucleus)[10] to the direct lateral cerebellar tract[11]
Anterior roots of the spinal nerves
Radices nervorum spinalium anteriores
Central canal—Canalis centralis
Motor (*i.e.*, anterior) root fibres
8/1
Motor nerve cells of the anterior grey column (anterior horn)[12]
Anterior or white commissure[3]
Commissura anterior alba

FIG. 1150.—TRANSVERSE SECTION THROUGH THE UPPERMOST PART OF THE LUMBAR PORTION OF THE SPINAL CORD (*see Appendix, note* [333]), WITH THE PIA MATER AND THE ARACHNOID. THE POSTERIOR VESICULAR COLUMN OF LOCKHART CLARKE, OR DORSAL NUCLEUS, NUCLEUS DORSALIS.[10] FROM A CHILD AGED THREE YEARS.

1 See Appendix, note 332. 2 See Appendix, note 335. 3 See Appendix, note 341.
4 Or *apex cornu posterioris*, *caput cornu posterioris*, and *cervix cornu posterioris*. See also note 4 to p. 754.
5 See Appendix, note 339. 6 Constituting the *motor cell column* or *cell column of the anterior horn*.
7 See Appendix, note 332. 8 See Appendix, note 329. 9 See Appendix, note 342.
10 See Appendix, note 343. 11 See Appendix, note 344.
12 These cells make up what Quain terms the *motor cell column* or the *cell column of the anterior horn*. Regarding the use of the term *anter or grey column* for the *anterior horn*, see Appendix, note 339.
13 See Appendix, note 345.

Medulla spinalis—The spinal cord (*see Appendix, note* [334]).

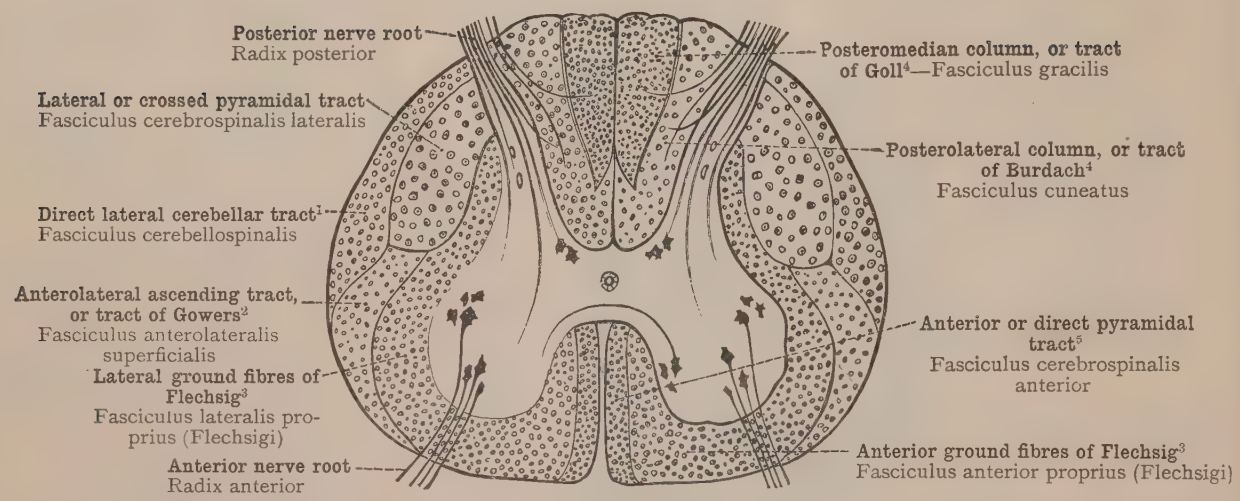


FIG. 1151.—DIAGRAMMATIC REPRESENTATION OF THE CONDUCTING SYSTEMS (CONDUCTING TRACTS) IN THE WHITE SUBSTANCE OF THE SPINAL CORD; AS SEEN IN A SECTION THROUGH THE LOWER EXTREMITY OF THE CERVICAL PORTION OF THE CORD (*see Appendix, note* [333]).

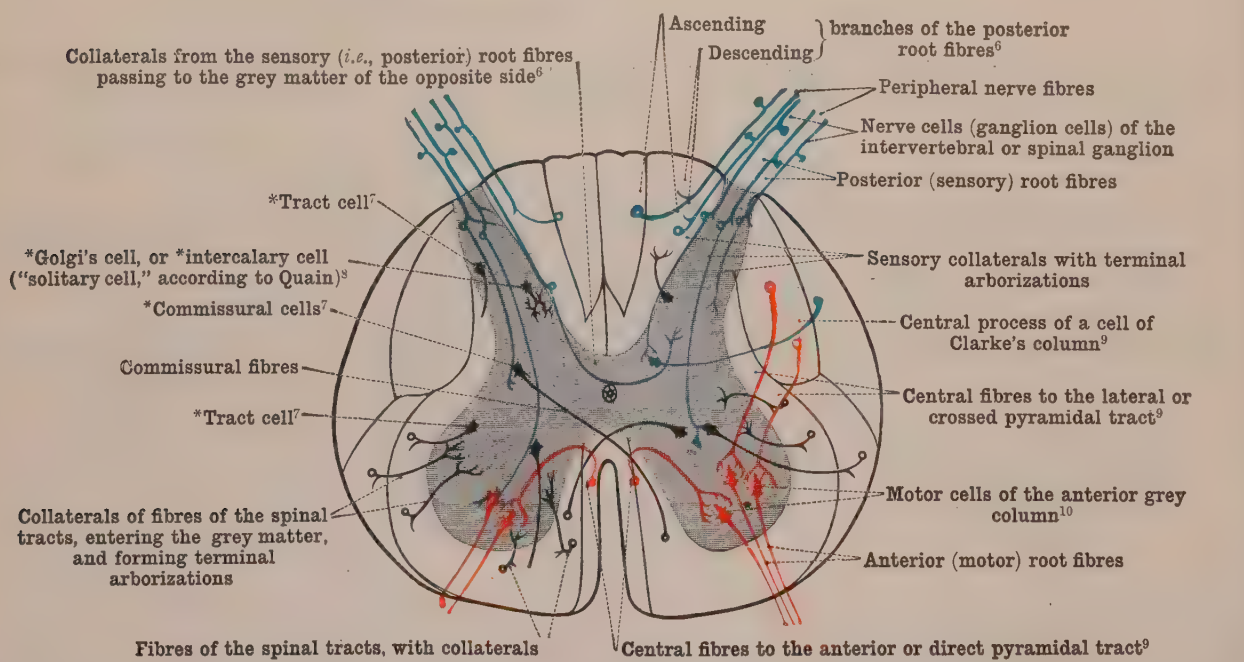

Ascending
Descending
branches of the posterior root fibres[6]
Collaterals from the sensory (*i.e.*, posterior) root fibres passing to the grey matter of the opposite side[6]
Peripheral nerve fibres
Nerve cells (ganglion cells) of the intervertebral or spinal ganglion
Posterior (sensory) root fibres
*Tract cell[7]
*Golgi's cell, or *intercalary cell ("solitary cell," according to Quain)[8]
*Commissural cells[7]
Commissural fibres
*Tract cell[7]
Collaterals of fibres of the spinal tracts, entering the grey matter, and forming terminal arborizations
Sensory collaterals with terminal arborizations
Central process of a cell of Clarke's column[9]
Central fibres to the lateral or crossed pyramidal tract[9]
Motor cells of the anterior grey column[10]
Anterior (motor) root fibres
Fibres of the spinal tracts, with collaterals
Central fibres to the anterior or direct pyramidal tract[9]

FIG. 1152.—DIAGRAMMATIC REPRESENTATION OF THE COURSE OF THE FIBRES OF THE SPINAL CORD, AS SEEN IN A SECTION THROUGH THE LOWER END OF THE CERVICAL PORTION OF THE CORD (*see Appendix, note* [333]).

1 See Appendix, note 344.
2 See Appendix, note 346.
3 See Appendix, note 347.
4 See Appendix, note 348.
5 Known also as the *column* or *tract of Türck.*
6 See Appendix, note 342.
7 See Appendix, note 349.
8 See Appendix, note 350.
9 See Appendix, note 352.
10 See Appendix, note 339.

Decursus fibrarum spinalium—Course of the fibres of the spinal cord.

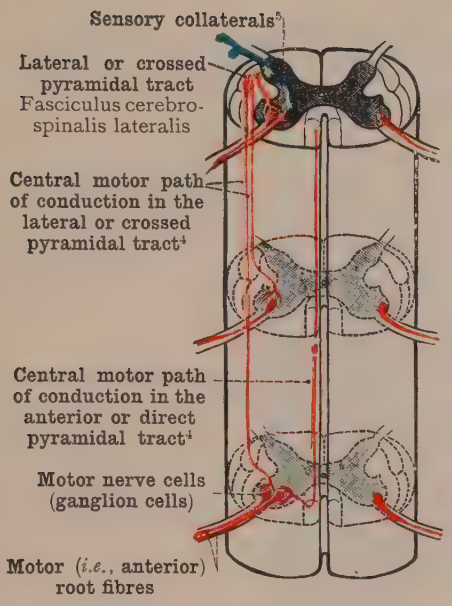

Sensory collaterals[5]
Lateral or crossed pyramidal tract
Fasciculus cerebro-spinalis lateralis
Central motor path of conduction in the lateral or crossed pyramidal tract[4]
Central motor path of conduction in the anterior or direct pyramidal tract[4]
Motor nerve cells (ganglion cells)
Motor (*i.e.*, anterior) root fibres

FIG. 1153.—DIAGRAMMATIC REPRESENTATION OF THE CENTRAL[4] MOTOR PATHS OF CONDUCTION IN THE SPINAL CORD. SEEN FROM BEFORE.

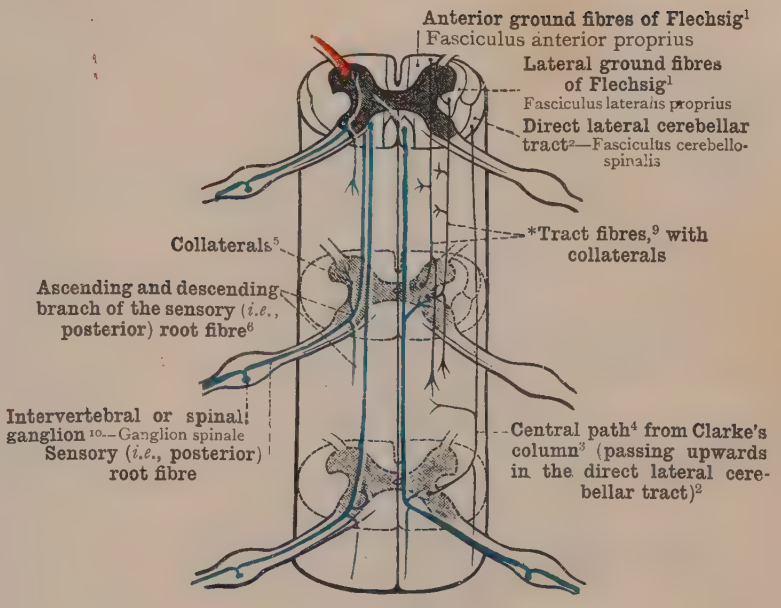

Anterior ground fibres of Flechsig[1]
Fasciculus anterior proprius
Lateral ground fibres of Flechsig[1]
Fasciculus lateralis proprius
Direct lateral cerebellar tract[2]—Fasciculus cerebello-spinalis
*Tract fibres,[9] with collaterals
Collaterals[5]
Ascending and descending branch of the sensory (*i.e.*, posterior) root fibre[6]
Intervertebral or spinal ganglion[10]—Ganglion spinale
Sensory (*i.e.*, posterior) root fibre
Central path[4] from Clarke's column[3] (passing upwards in the direct lateral cerebellar tract)[2]

FIG. 1154.—DIAGRAMMATIC REPRESENTATION OF THE CENTRAL[4] SENSORY PATHS OF CONDUCTION IN THE SPINAL CORD. SEEN FROM BEHIND.

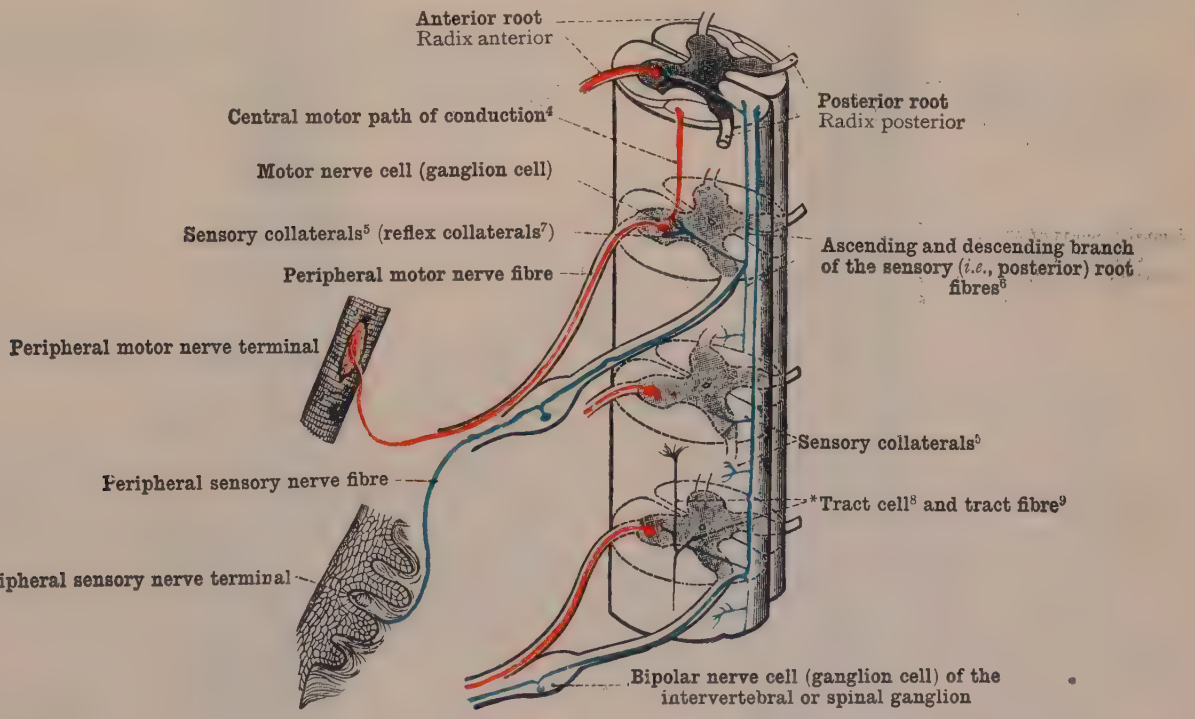
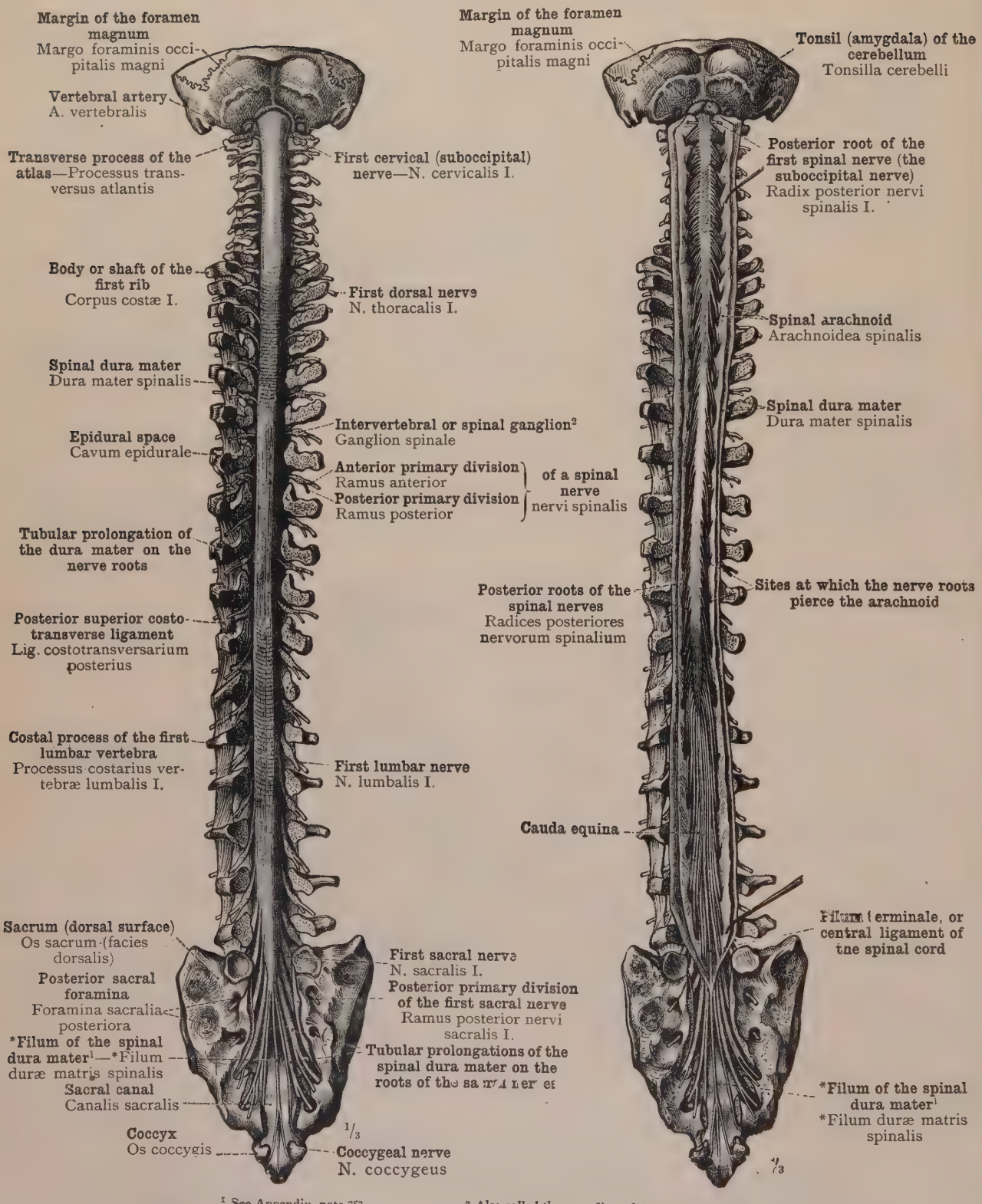

Anterior root
Radix anterior
Central motor path of conduction[4]
Motor nerve cell (ganglion cell)
Sensory collaterals[5] (reflex collaterals[7])
Peripheral motor nerve fibre
Peripheral motor nerve terminal
Peripheral sensory nerve fibre
Peripheral sensory nerve terminal
Posterior root
Radix posterior
Ascending and descending branch of the sensory (*i.e.*, posterior) root fibres[6]
Sensory collaterals[5]
*Tract cell[8] and tract fibre[9]
Bipolar nerve cell (ganglion cell) of the intervertebral or spinal ganglion

FIG. 1155.—DIAGRAMMATIC REPRESENTATION OF THE MOTOR AND SENSORY PATHS OF CONDUCTION, AND OF THE REFLEX ARCS OF THE SPINAL CORD.

1 See Appendix, note 347. 2 See Appendix, note 344. 3 See note 3 to p. 754.
4 Regarding the significance of the term *central* in these instances, see Appendix, note 351.
5 See Appendix, note 321. 6 See Appendix, note 342. 7 See Appendix, note 352. 8 See Appendix, note 349.
9 *Tract Fibre.*—The author uses the term *tract fibre* (*Strangfaser*) as an abbreviation for *fibre of one of the tracts of the white matter of the spinal cord.*
10 Also called the *ganglion of the posterior root.*

Decursus fibrarum spinalium—Course of the fibres of the spinal cord.


Margin of the foramen magnum
Margo foraminis occipitalis magni
Vertebral artery
A. vertebralis
Transverse process of the atlas—Processus transversus atlantis
First cervical (suboccipital) nerve—N. cervicalis I.
Body or shaft of the first rib
Corpus costæ I.
First dorsal nerve
N. thoracalis I.
Spinal dura mater
Dura mater spinalis
Epidural space
Cavum epidurale
Intervertebral or spinal ganglion[2]
Ganglion spinale
Anterior primary division
Ramus anterior
Posterior primary division
Ramus posterior
of a spinal nerve
nervi spinalis
Tubular prolongation of the dura mater on the nerve roots
Posterior superior costotransverse ligament
Lig. costotransversarium posterius
Costal process of the first lumbar vertebra
Processus costarius vertebræ lumbalis I.
First lumbar nerve
N. lumbalis I.
Sacrum (dorsal surface)
Os sacrum (facies dorsalis)
Posterior sacral foramina
Foramina sacralia posteriora
*Filum of the spinal dura mater[1]—*Filum duræ matris spinalis
Sacral canal
Canalis sacralis
Coccyx
Os coccygis
1/3
First sacral nerve
N. sacralis I.
Posterior primary division of the first sacral nerve
Ramus posterior nervi sacralis I.
Tubular prolongations of the spinal dura mater on the roots of the sacral nerves
Coccygeal nerve
N. coccygeus
Margin of the foramen magnum
Margo foraminis occipitalis magni
Tonsil (amygdala) of the cerebellum
Tonsilla cerebelli
Posterior root of the first spinal nerve (the suboccipital nerve)
Radix posterior nervi spinalis I.
Spinal arachnoid
Arachnoidea spinalis
Spinal dura mater
Dura mater spinalis
Posterior roots of the spinal nerves
Radices posteriores nervorum spinalium
Sites at which the nerve roots pierce the arachnoid
Cauda equina
Filum terminale, or central ligament of the spinal cord
*Filum of the spinal dura mater[1]
*Filum duræ matris spinalis
1/3

[1] See Appendix, note 353.

[2] Also called the *ganglion of the posterior root.*

FIG. 1156.—THE SPINAL DURA MATER, DURA MATER SPINALIS, UNOPENED. SEEN FROM BEHIND.

FIG. 1157.—THE SPINAL DURA MATER, DURA MATER SPINALIS, AND THE SPINAL ARACHNOID, ARACHNOIDEA SPINALIS, BOTH OPENED FROM BEHIND.

Meninges spinales—The membranes of the spinal cord.

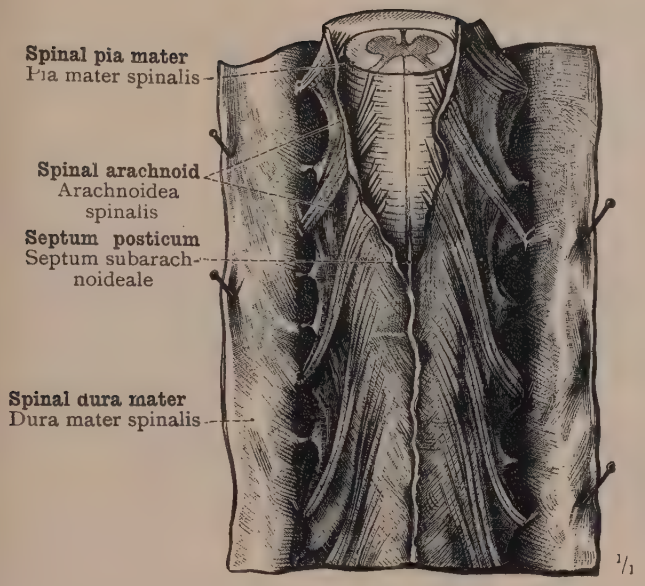


FIG. 1158.—THE SPINAL ARACHNOID, ARACHNOIDEA SPINALIS, EXPOSED IN PART OF THE CERVICAL PORTION OF THE SPINAL CORD[1] BY INCISING THE DURA MATER FROM BEHIND.

In the upper part of the preparation the arachnoid has been divided in the median line and the margins of the incision have been drawn apart.

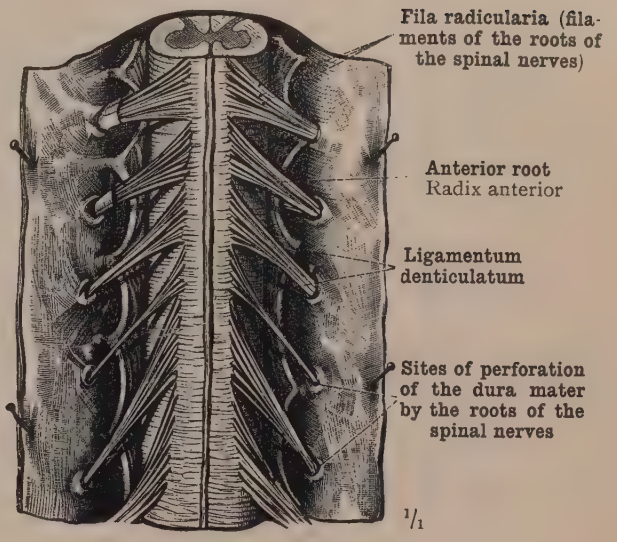

Fila radicularia (filaments of the roots of the spinal nerves)
Anterior root
Radix anterior
Ligamentum denticulatum
Sites of perforation of the dura mater by the roots of the spinal nerves
1/1

FIG. 1159.—THE LIGAMENTUM DENTICULATUM, WHICH SUPPORTS THE SPINAL CORD WITHIN THE THECA VERTEBRALIS, AS SEEN IN PART OF THE CERVICAL PORTION OF THE CORD,[1] AFTER THE DURA MATER HAS BEEN INCISED FROM BEFORE, AND THE ARACHNOID REMOVED FROM THE FRONT OF THE CORD.

[1] See Appendix, note 333.

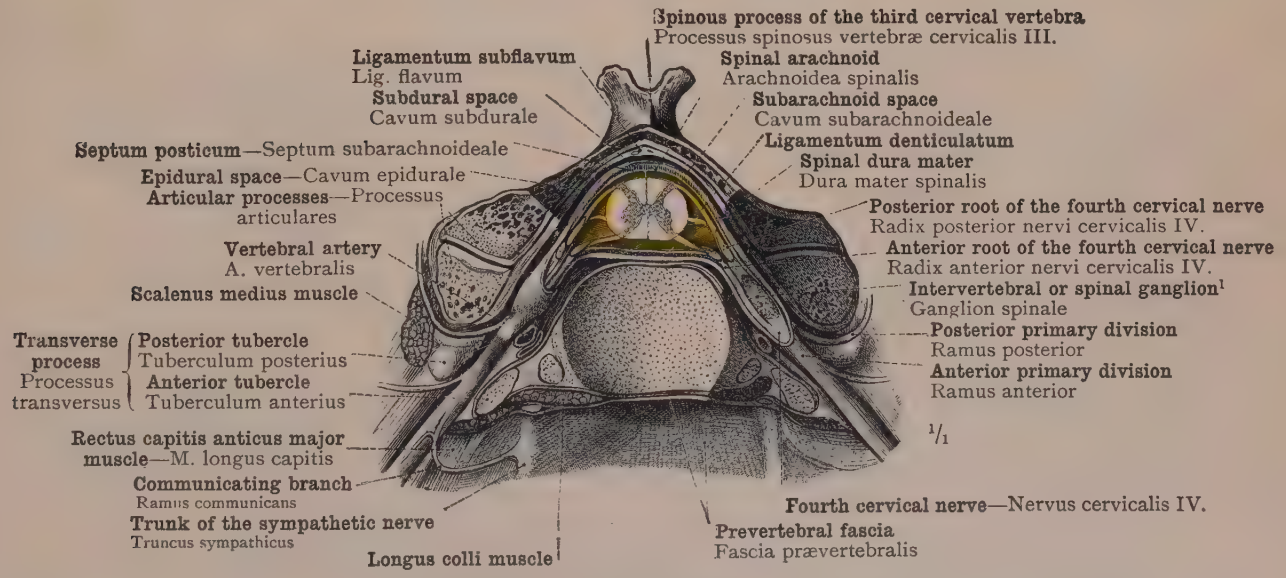
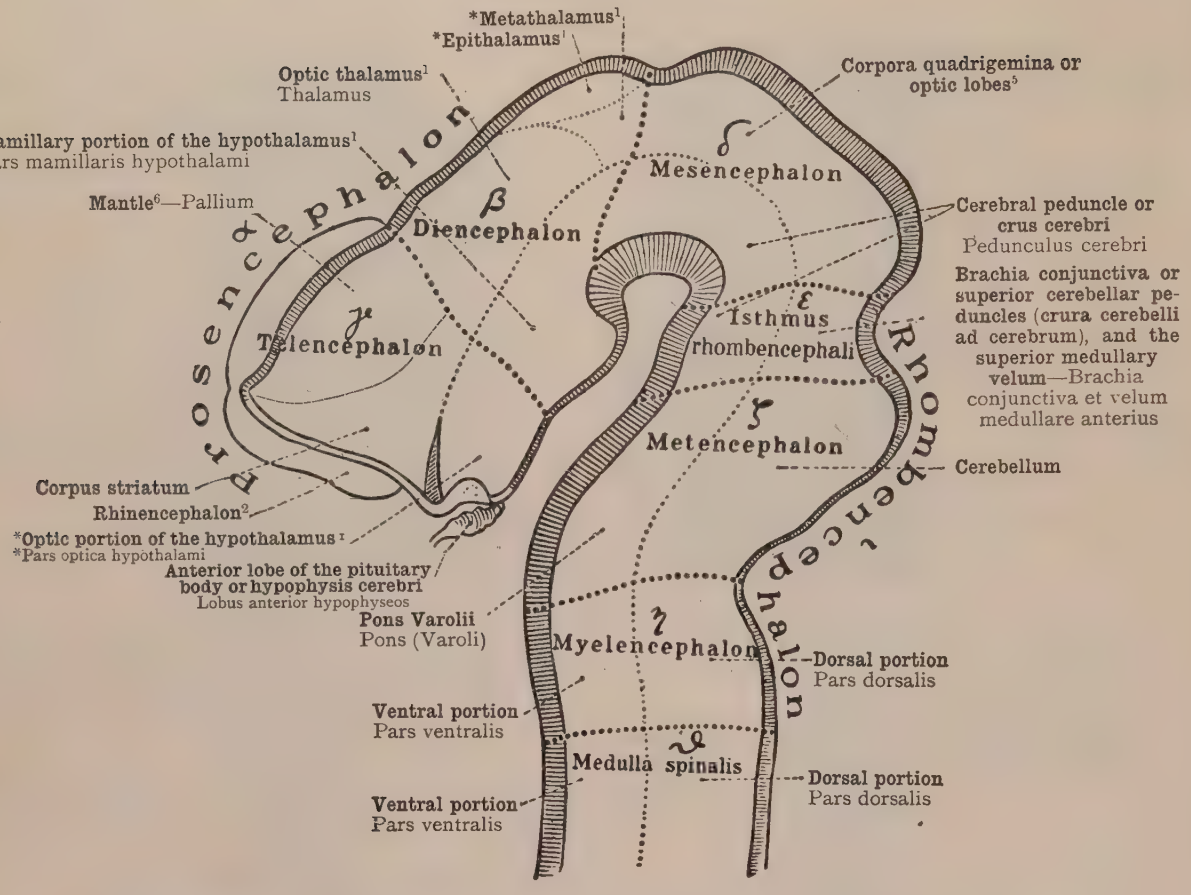


FIG. 1160.—TRANSVERSE SECTION THROUGH THE INTERVERTEBRAL DISC BETWEEN THE THIRD AND FOURTH CERVICAL VERTEBRÆ. THE MEMBRANES OF THE SPINAL CORD ARE SEEN IN TRANSVERSE SECTION, AND THEIR RELATION TO THE EMERGING SPINAL NERVE ROOTS IS DISPLAYED.

The subarachnoid space is printed yellow; the subdural space, blue; and the epidural space, black.

[1] Also called the *ganglion of the posterior root.*

Meninges spinales—The membranes of spinal cord.



α Anterior primary vesicle or forebrain[3]
β Second secondary vesicle, interbrain, or thalamencephalon[1]
γ First secondary vesicle or prosencephalon[3]
δ Third secondary vesicle, midbrain, or mesencephalon[3]
ε Isthmus between third and fourth cerebral vesicles or isthmus of His[4]
ζ Fourth secondary vesicle or epencephalon
η Fifth secondary vesicle or metencephalon[3]
θ Spinal cord
ι *Rhombencephalon,[4] posterior primary vesicle, or hind-brain

FIG. 1161.—MEDIAN SAGITTAL SECTION THROUGH THE BRAIN OF A HUMAN EMBRYO AT THE END OF THE FIRST MONTH OF INTRA-UTERINE LIFE (MONTH OF FOUR WEEKS ONLY). DIAGRAMMATIC. AFTER W. HIS.

[1] See Appendix, note 354.

[2] *Rhinencephalon.*—A name sometimes given to the combined *olfactory* and *limbic lobes*.

[3] Some confusion is inevitable owing to the fact that the names given to the parts of the developing brain are used differently by Quain and by Von Langer and Toldt. The exact significance of the English renderings to the above diagram will be found in Quain's "Anatomy," vol. i., part i., p. 61. Here it is sufficient to indicate that—(1) the term *prosencephalon* is used by the German authors to denote the *anterior primary vesicle* or *fore-brain* as a whole, but by Quain to denote the *first secondary vesicle* only (called by Toldt *telencephalon*); (2) as the *middle primary vesicle* produces *one secondary vesicle* only (the *third*), the terms *mid-brain* and *mesencephalon* may be applied to this indifferently; (3) the term *epencephalon*, as used by Quain, appears to denote the combined *isthmus rhombencephali* and *metencephalon* of the German authors; and (4) the term *metencephalon*, as used by Quain, denotes what Von Langer and Toldt call the *myelencephalon*.

[4] For the exact significance of the term *rhombencephalon* as used by the author, see Appendix, notes 355 and 369.

[5] *Optic Lobes.*—This name is given by Macalister to the structures which nearly all other English anatomists agree in calling the *corpora quadrigemina*. The fact that the *corpora quadrigemina* of the mammalian brain are the homologues of the *corpora bigemina* or *optic lobes* of the avian brain does not seem an adequate reason for discarding an apt and well-established name.

[6] *Mantle or Pallium.*—"The basal ganglia of the brain, together with the crura cerebri, pons, and medulla, are often distinguished as the *stem* of the brain [*caudex cerebri*, Ger. *Hirnstamm*] from the superimposed hemispheres, which are known as the *mantle* of the brain [*pallium*, Ger. *Hirnmantel*]" (Von Langer and Toldt, *op. cit.*, pp. 600, 601). Writing of the *first secondary vesicle* (*prosencephalon*), Quain (*op. cit.*, vol. iii., part i., pp. 69, 70) says: "The original vesicle is relatively small, although its lateral outgrowths form by far the largest portions of the brain in higher vertebrates. The *corpora striata* appear as thickenings of the floor of the hemisphere vesicles, and outside them the grey and white matter of the island of Reil becomes differentiated. The rest of the wall of the hemisphere vesicle (*mantle* of Reichert) eventually thickens to form the whole of the grey and white matter of the hemispheres."

Divisions of the Brain from the Embryological Standpoint.

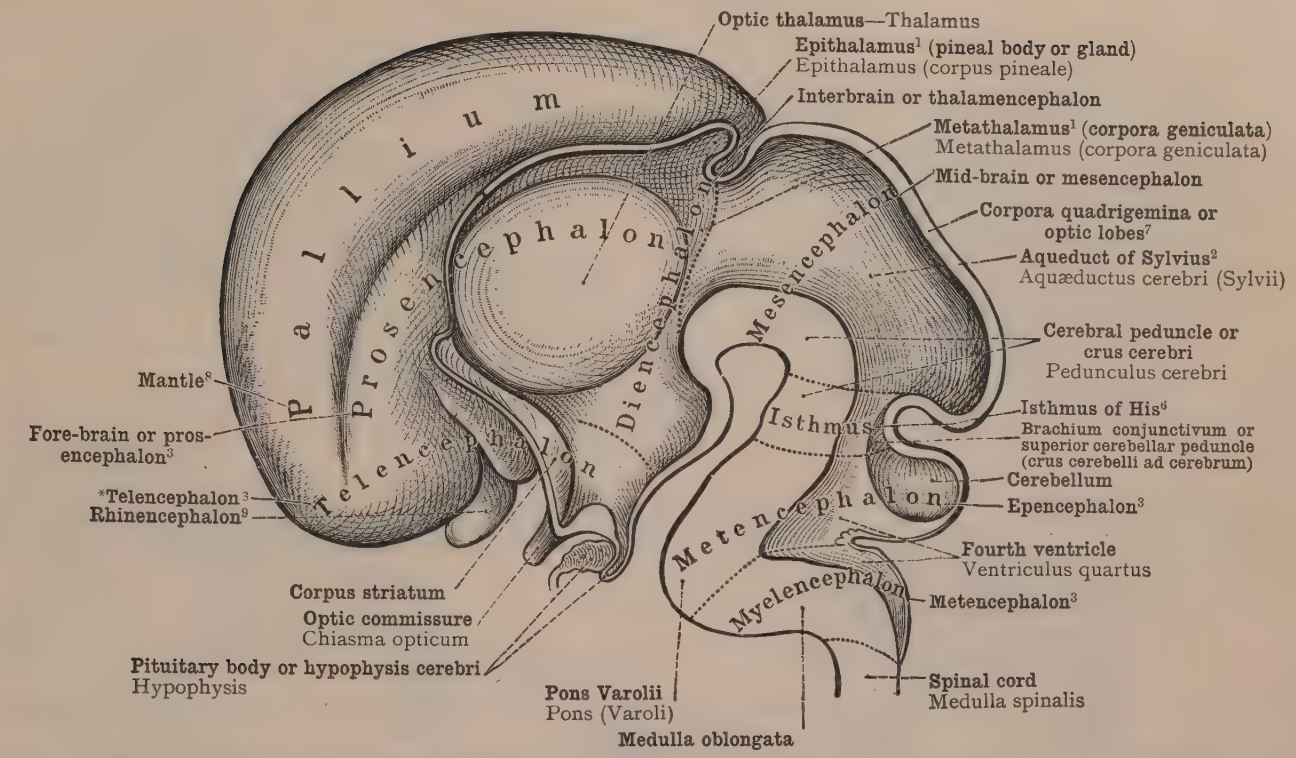


FIG. 1162.—MEDIAN SAGITTAL SECTION THROUGH THE BRAIN OF A HUMAN EMBRYO IN THE THIRD MONTH OF INTRA-UTERINE LIFE (MONTHS OF FOUR WEEKS EACH). AFTER W. HIS.

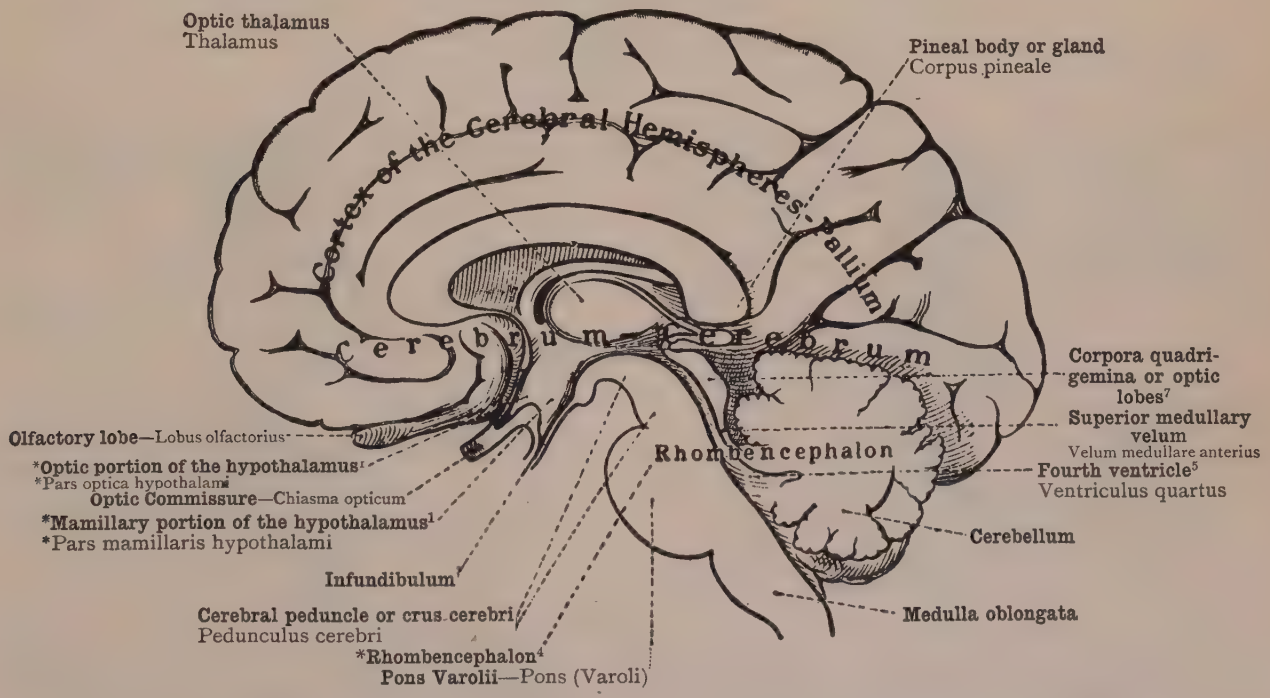
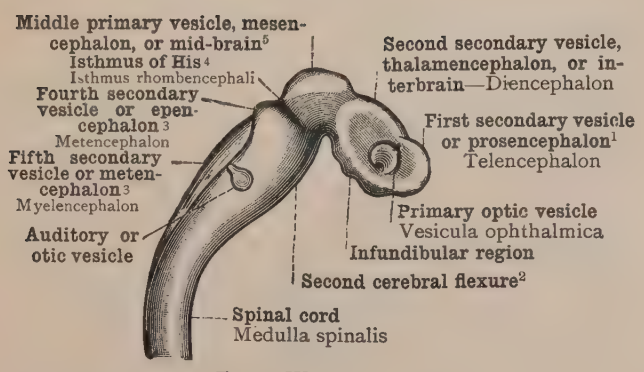


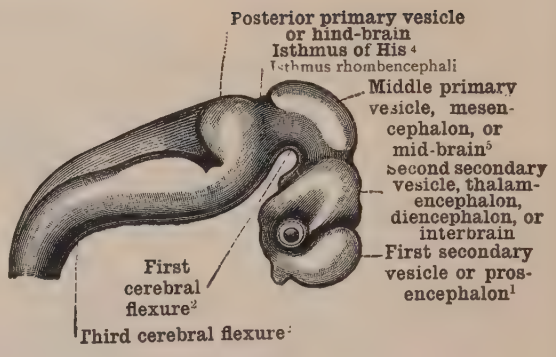
FIG. 1163.—MEDIAN SAGITTAL SECTION THROUGH THE ADULT HUMAN BRAIN. AFTER W. HIS.

1 See Appendix, note 354. 2 Or *iter a tertio ad quartum ventriculum.* 3 See note 3 to p. 760.
4 See Appendix, note 355. 5 Sometimes called *fossa rhomboidalis.* See also Appendix, note 355.
6 *Isthmus of His.*—This is the constriction between the third and fourth secondary vesicles. See Appendix, note 369.
7 See note 5 to p. 760. 8 See note 6 to p. 760. 9 See note 2 to p. 760.

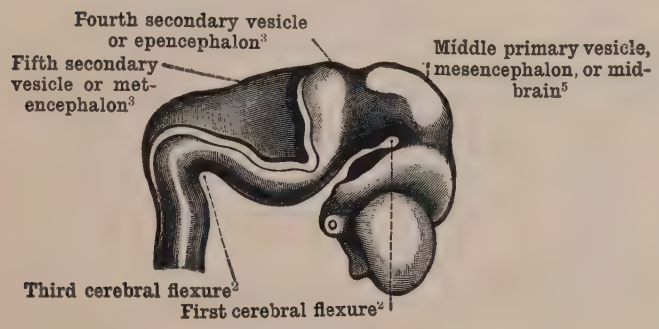
Divisions of the Brain from the Embryological Standpoint.



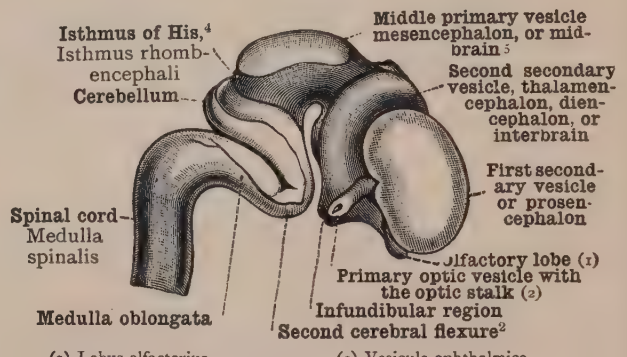
THIRD WEEK.


Posterior primary vesicle or hind-brain
Isthmus of His[4]
Isthmus rhombencephali
Middle primary vesicle, mesencephalon, or mid-brain[5]
Second secondary vesicle, thalamencephalon, diencephalon, or interbrain
First secondary vesicle or prosencephalon[1]
First cerebral flexure[2]
Third cerebral flexure[2]

FOURTH WEEK.


Fourth secondary vesicle or epencephalon[3]
Fifth secondary vesicle or metencephalon[3]
Middle primary vesicle, mesencephalon, or mid-brain[5]
Third cerebral flexure[2]
First cerebral flexure[2]

FIFTH WEEK.



EIGHTH WEEK.

FIG. 1164.—RECONSTRUCTED FIGURES[6] OF THE RUDIMENTARY BRAIN OF HUMAN EMBRYOS. AFTER W. HIS.

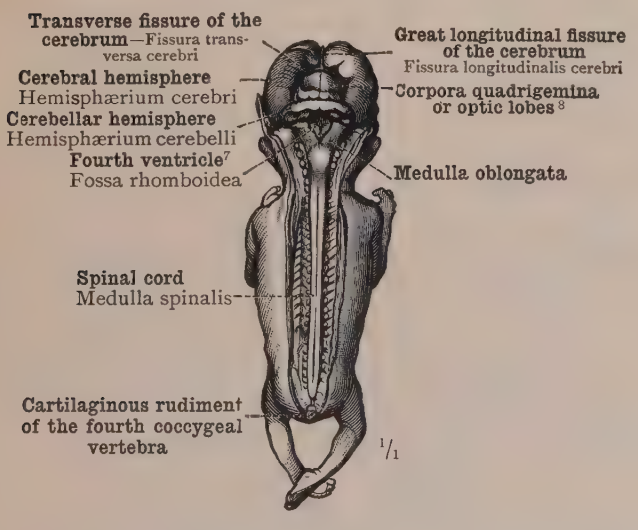


FIG. 1165.—BRAIN AND SPINAL CORD OF A HUMAN EMBRYO AT THE END OF THE THIRD MONTH OF INTRA-UTERINE LIFE (MONTHS OF FOUR WEEKS EACH), SEEN FROM BEHIND.

Body-length, 6·2 centimetres (2·44 inches).

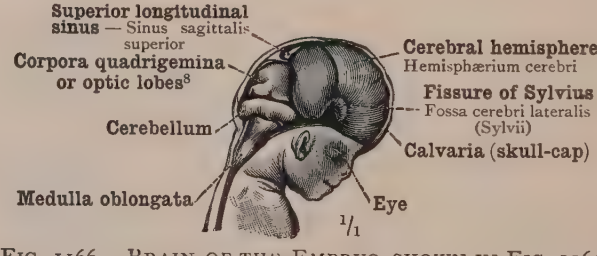


FIG. 1166.—BRAIN OF THE EMBRYO SHOWN IN FIG. 1165, SEEN IN THIS CASE FROM THE RIGHT SIDE.

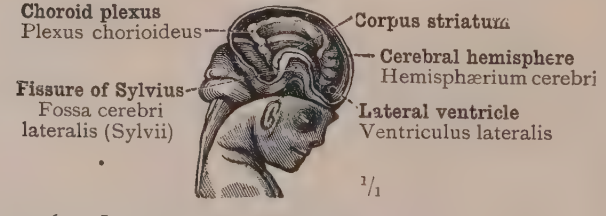


FIG. 1167.—INTERIOR OF THE RIGHT CEREBRAL HEMISPHERE, AS SEEN AFTER REMOVING THE CALVARIA (SKULL-CAP) AND THE CONVEX WALL OF THE CEREBRUM, IN THE EMBRYO SHOWN IN FIG. 1165.

1 *Telencephalon*, according to Toldt. See note 3 to p. 760. 2 See Appendix, note 356. 3 See Appendix, note 357.
4 *Isthmus of His.*—This is the constriction between the third and fourth secondary vesicles. See Appendix, note 362.
5 See Appendix, note 358.
6 By the term *reconstructed figures* (*Constructionsbilder*) is meant that these profile figures have been reconstructed from sections.
7 See Appendix, note 355. 8 See note 5 to p. 760.

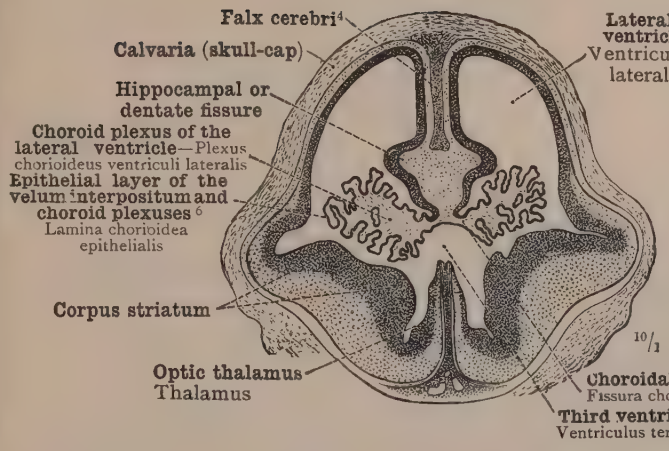


FIG. 1168.—CORONAL SECTION THROUGH THE HEAD, PASSING BETWEEN THE FRONTAL AND PARIETAL LOBES OF THE BRAIN; FROM A HUMAN EMBRYO EIGHT WEEKS OLD.

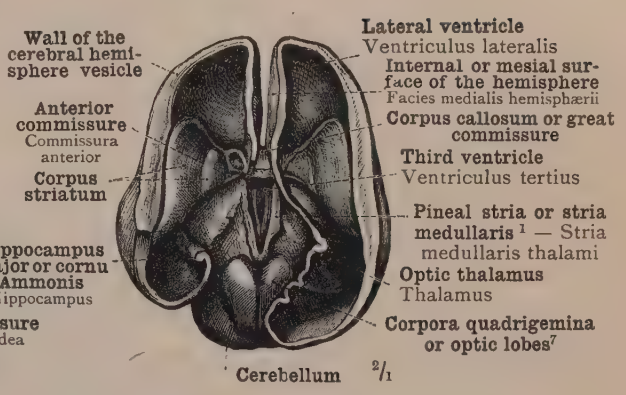


FIG. 1169.—THE INTERIOR OF THE CEREBRAL HEMISPHERE VESICLES OF A HUMAN EMBRYO AT THE END OF THE FOURTH MONTH (MONTHS OF FOUR WEEKS EACH), HAVING A BODY-LENGTH OF 11·8 CENTIMETRES (4·65 INCHES). SEEN FROM ABOVE.

The cerebral hemisphere vesicles were opened by the removal of their convex summits.

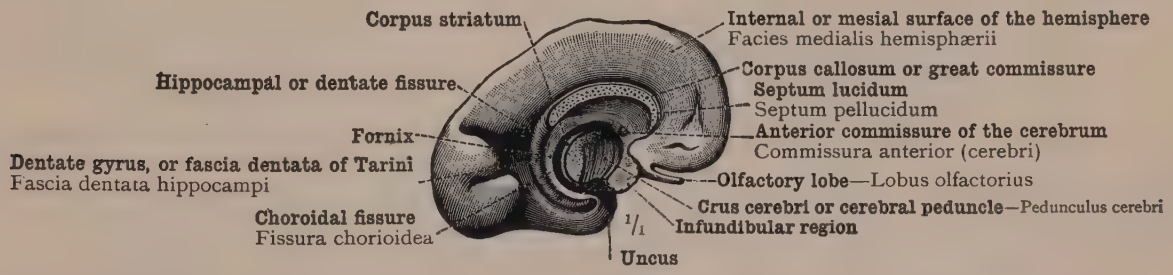


FIG. 1170.—LEFT CEREBRAL HEMISPHERE OF A HUMAN FŒTUS IN THE MIDDLE OF THE SIXTH MONTH (MONTHS OF FOUR WEEKS EACH), HAVING A BODY-LENGTH OF 25 CENTIMETRES (9·84 INCHES). SEEN FROM THE INNER SIDE.

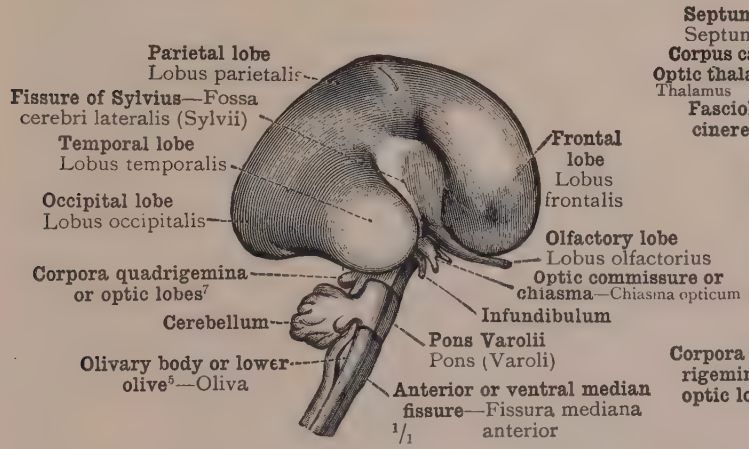


FIG. 1171.—BRAIN OF A HUMAN FŒTUS IN THE MIDDLE OF THE SIXTH MONTH (MONTHS OF FOUR WEEKS EACH), HAVING A BODY-LENGTH OF 25 CENTIMETRES (9·84 INCHES). THE OUTER OR CONVEX SURFACE OF THE RIGHT HEMISPHERE.

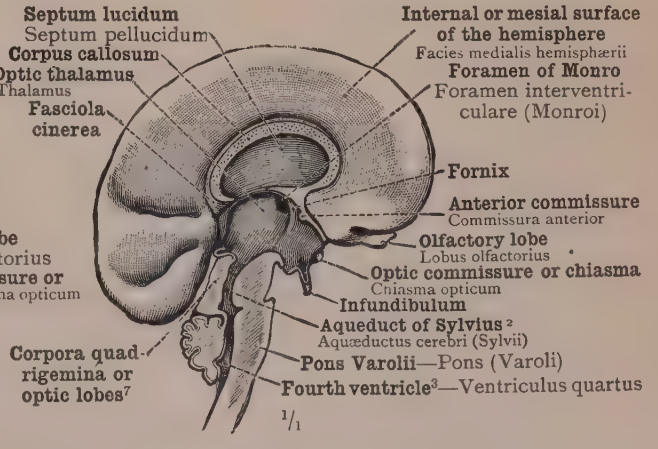


FIG. 1172.—MEDIAN SAGITTAL SECTION THROUGH THE BRAIN OF A HUMAN FŒTUS IN THE END OF THE SIXTH MONTH (MONTHS OF FOUR WEEKS EACH), HAVING A BODY-LENGTH OF 29 CENTIMETRES (11·42 INCHES). INNER OR MESIAL SURFACE OF THE LEFT HEMISPHERE.

1 See Appendix, note 359. 2 Or *iter a tertio ad quartum ventriculum.* 3 See Appendix, note 355.
4 Sometimes distinguished by the name of *falx major* from the *falx minor* or *falx cerebelli.*
5 See Appendix, note 327. 6 See note 9 to p. 767. 7 See note 5 to p. 760.

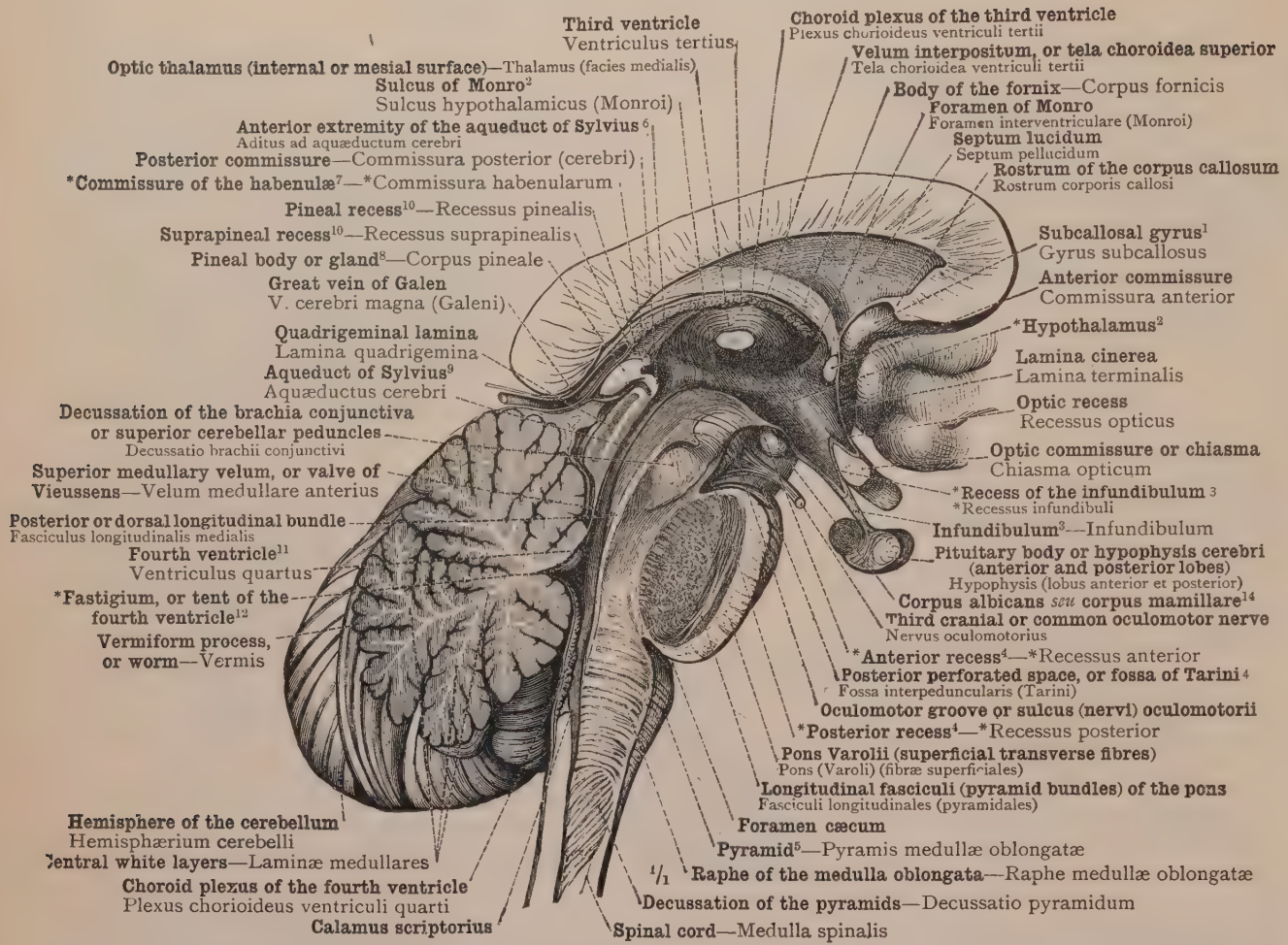


FIG. 1173.—PART OF A MEDIAN SAGITTAL SECTION THROUGH THE BRAIN. LEFT HALF. THE CONSTITUENTS OF THE *RHOMBENCEPHALON (*see Appendix, note* 335): THE MEDULLA OBLONGATA, THE PONS VAROLII, AND THE CEREBELLUM. THE CONSTITUENTS OF THE MESENCEPHALON OR MID-BRAIN: THE QUADRIGEMINAL BODIES OR OPTIC LOBES (CORPORA QUADRIGEMINA—*see note* 5 *to p.* 760), AND THE CEREBRAL PEDUNCLES OR CRURA CEREBRI (PEDUNCULI CEREBRI). THE CONSTITUENTS OF THE THALAMENCEPHALON OR INTERBRAIN (*DIENCEPHALON—*see Appendix, note* 354): THE OPTIC THALAMI AND THE HYPOTHALAMUS[2] WITH THE PITUITARY BODY, OR HYPOPHYSIS CEREBRI, AND THE PINEAL BODY OR GLAND, OR EPIPHYSIS CEREBRI—THE LAST-NAMED BEING COVERED BY THE CORPUS CALLOSUM OR GREAT COMMISSURE AND BY THE FORNIX. THE THIRD AND FOURTH VENTRICLES (VENTRICULI TERTIUS ET QUARTUS), CONNECTED BY THE AQUEDUCT OF SYLVIUS OR ITER A TERTIO AD QUARTUM VENTRICULUM (AQUEDUCTUS CEREBRI), AND CLOSED IN BY THE CHOROID PLEXUSES OF THE THIRD AND FOURTH VENTRICLES RESPECTIVELY (PLEXUS CHORIOIDEI VENTRICULI TERTII ET QUARTI). THE COMMISSURES OF THE CEREBRUM,[13] ANTERIOR AND POSTERIOR (COMMISSURA ANTERIOR ET COMMISSURA POSTERIOR CEREBRI), ARE CUT ACROSS IN THE MEDIAN PLANE. ON THE INTERNAL OR MESIAL SURFACE OF THE OPTIC THALAMUS THE MIDDLE OR SOFT COMMISSURE (MASSA INTERMEDIA) IS ALSO SEEN IN MEDIAN SAGITTAL SECTION. IN THE POSTERIOR PERFORATED SPACE OR FOSSA OF TARINI (FOSSA INTERPEDUNCULARIS TARINI) WE SEE THE *ANTERIOR RECESS (*RECESSUS ANTERIOR) BEHIND THE CORPUS ALBICANS SEU MAMILLARE, AND THE *POSTERIOR RECESS (*RECESSUS POSTERIOR) ABOVE THE UPPER MARGIN OF THE PONS VAROLII (*see Appendix, note* 362). IN THE SECTION OF THE CEREBELLUM WE SEE THE LAYERS OF WHITE SUBSTANCE (LAMINÆ MEDULLARES) RAMIFYING OUTWARDS FROM THE WHITE CENTRE, AND SURROUNDED BY THE GREY CORTICAL SUBSTANCE (SUBSTANTIA CORTICALIS CEREBELLI); TO THE ARBORESCENT APPEARANCE THUS PRODUCED THE NAME OF ARBOR VITÆ CEREBELLI IS GIVEN.

[1] Or the "so-called *peduncle of the corpus callosum*" (Quain)—"formerly known as *pedunculus corporis callosi*" (Von Langer and Toldt). [2] See Appendix, note 360. [3] See Appendix, note 361.
[4] See Appendix, note 362. [5] See Appendix, note 363. [6] See Appendix, note 364.
[7] *Commissure of the Habenulæ.*—Macalister calls this the *transverse frænulum of the pineal body*; according to Quain, it is the *middle* of the *upper* or *dorsal portion* of the *pedunculus conarii* or *habenula.* See detailed explanation in Appendix, note 365.
[8] Also known as the *conarium*, and as the *epiphysis cerebri.* See Appendix, note 365.
[9] Or *iter a tertio ad quartum ventriculum.* [10] See Appendix, note 365. [11] See Appendix, note 356.
[12] See Appendix, note 366.
[13] In the original German, the anterior and posterior commissures are spoken of as the *commissures of the third ventricle.*
[14] Also known as the *bulb of the fornix.*

*Rhombencephalon, Mesencephalon, and Thalamencephalon.

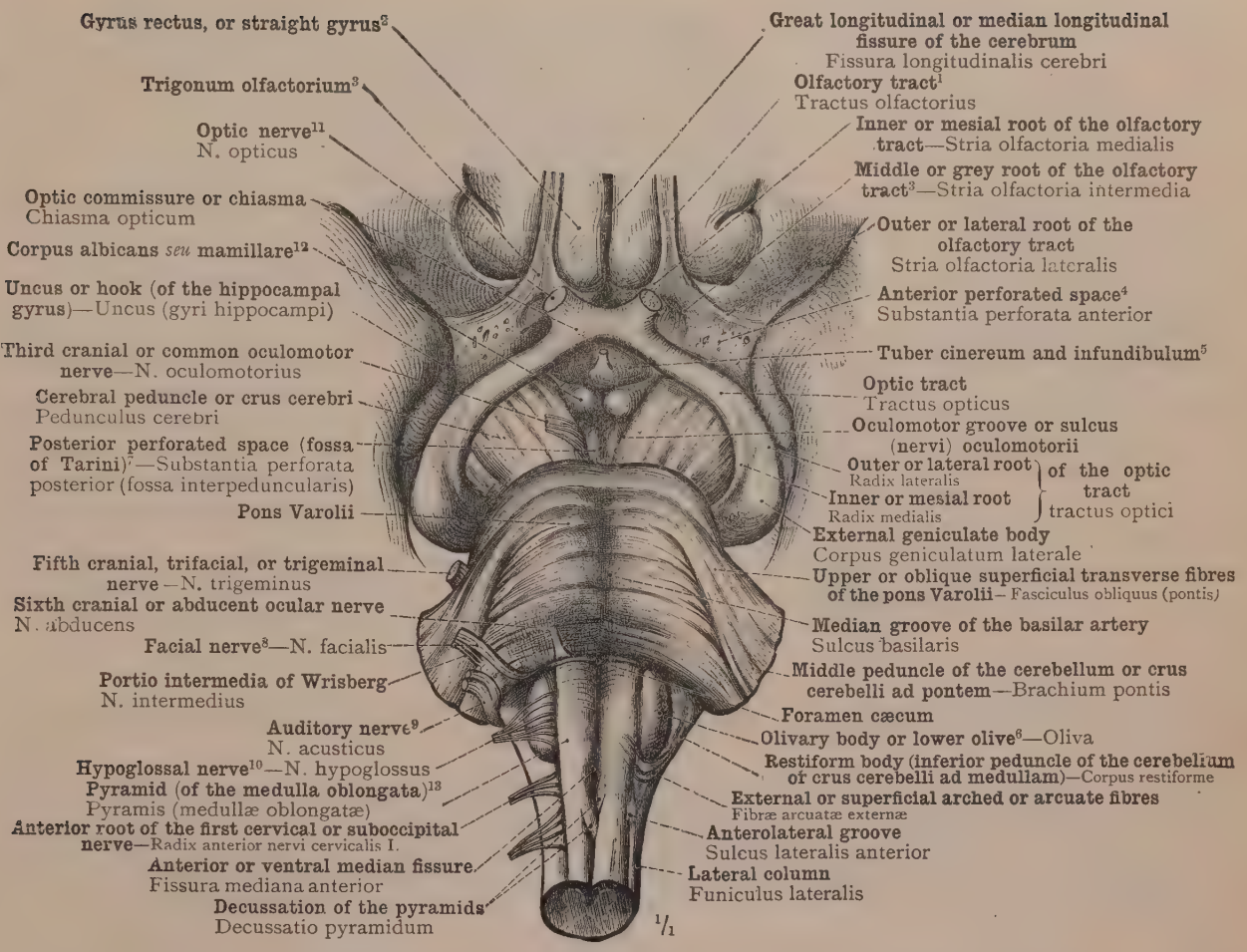
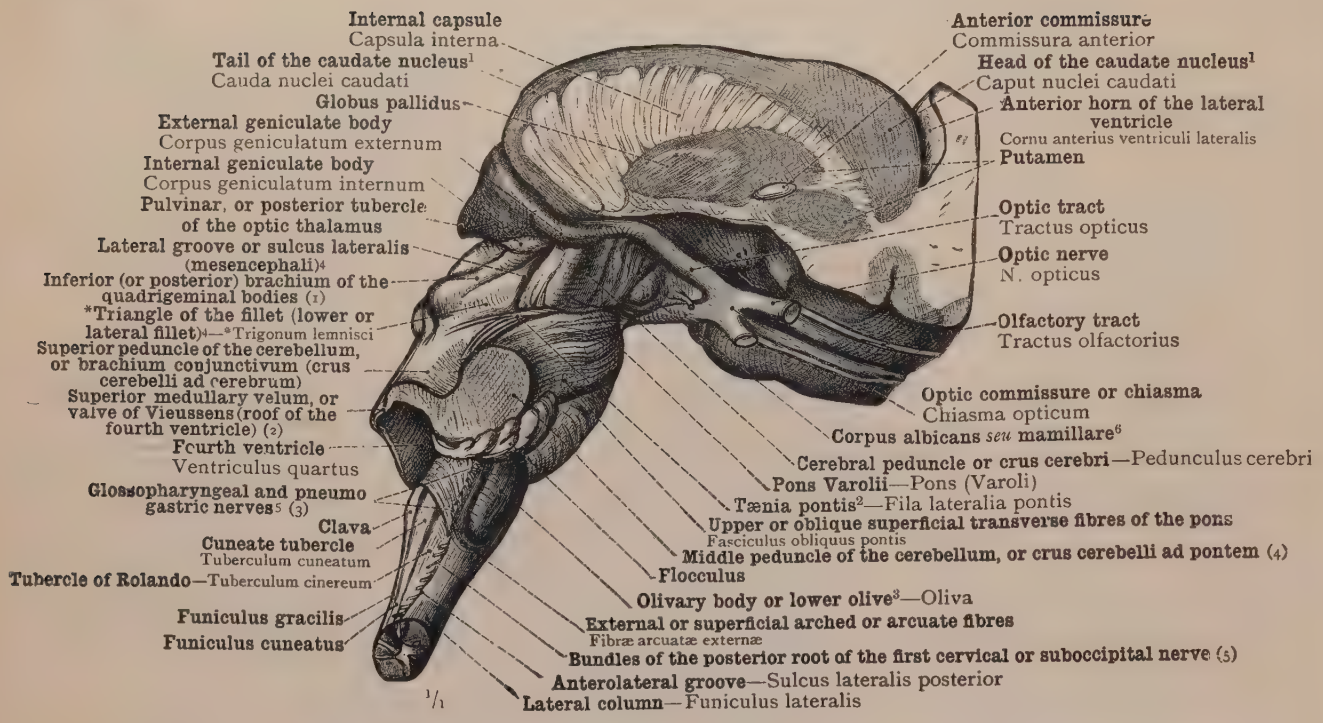

Gyrus rectus, or straight gyrus[2]
Trigonum olfactorium[3]
Optic nerve[11]
N. opticus
Optic commissure or chiasma
Chiasma opticum
Corpus albicans *seu* mamillare[12]
Uncus or hook (of the hippocampal gyrus)—Uncus (gyri hippocampi)
Third cranial or common oculomotor nerve—N. oculomotorius
Cerebral peduncle or crus cerebri
Pedunculus cerebri
Posterior perforated space (fossa of Tarini)[7]—Substantia perforata posterior (fossa interpeduncularis)
Pons Varolii
Fifth cranial, trifacial, or trigeminal nerve—N. trigeminus
Sixth cranial or abducent ocular nerve
N. abducens
Facial nerve[8]—N. facialis
Portio intermedia of Wrisberg
N. intermedius
Auditory nerve[9]
N. acusticus
Hypoglossal nerve[10]—N. hypoglossus
Pyramid (of the medulla oblongata)[13]
Pyramis (medullæ oblongatæ)
Anterior root of the first cervical or suboccipital nerve—Radix anterior nervi cervicalis I.
Anterior or ventral median fissure
Fissura mediana anterior
Decussation of the pyramids
Decussatio pyramidum
Great longitudinal or median longitudinal fissure of the cerebrum
Fissura longitudinalis cerebri
Olfactory tract[1]
Tractus olfactorius
Inner or mesial root of the olfactory tract—Stria olfactoria medialis
Middle or grey root of the olfactory tract[3]—Stria olfactoria intermedia
Outer or lateral root of the olfactory tract
Stria olfactoria lateralis
Anterior perforated space[4]
Substantia perforata anterior
Tuber cinereum and infundibulum[5]
Optic tract
Tractus opticus
Oculomotor groove or sulcus (nervi) oculomotorii
Outer or lateral root of the optic tract
Radix lateralis
Inner or mesial root of the optic tract
Radix medialis
tractus optici
External geniculate body
Corpus geniculatum laterale
Upper or oblique superficial transverse fibres of the pons Varolii—Fasciculus obliquus (pontis)
Median groove of the basilar artery
Sulcus basilaris
Middle peduncle of the cerebellum or crus cerebelli ad pontem—Brachium pontis
Foramen cæcum
Olivary body or lower olive[6]—Oliva
Restiform body (inferior peduncle of the cerebellum or crus cerebelli ad medullam)—Corpus restiforme
External or superficial arched or arcuate fibres
Fibræ arcuatæ externæ
Anterolateral groove
Sulcus lateralis anterior
Lateral column
Funiculus lateralis
1/1

FIG. 1174.—THE MEDULLA OBLONGATA WITH THE PONS VAROLII, THE CEREBRAL PEDUNCLES OR CRURA CEREBRI (PEDUNCULI CEREBRI), AND THE ADJOINING PARTS AT THE FLOOR OF THE INTERBRAIN, SEEN FROM THE BASAL SURFACE.

The two temporal lobes of the cerebrum were drawn far apart, in order that the optic tract (which is partially covered by the inner margin of the temporal lobe—*i.e.*, by the hippocampal gyrus and its uncus), and the relation of this tract to the external geniculate body, might be fully displayed. Between the crura cerebri, diverging as they pass forwards from the pons Varolii, is the fossa of Tarini (fossa interpeduncularis), the floor of which is formed by the posterior perforated lamina or plate (*see note 7 below*); the outer boundary of the posterior perforated space is the oculomotor groove (sulcus nervi oculomotorii) in which the root bundles of the third cranial or common oculomotor nerve emerge from the brain. On the right side these root fibres have been preserved, but on the left they have been removed. By the separation of the two temporal lobes, the anterior perforated space (substantia perforata anterior—*see note 4 below*) has been exposed on either side, and its delimitation anteriorly by the trigonum olfactorium and posteriorly by the optic tract has been displayed. The cerebellum has been cut away on either side along the line of entry of its middle peduncles, the crura cerebelli ad pontem (brachia pontis).

1 Sometimes erroneously spoken of as the *olfactory nerve*. 2 See Appendix, note 367. 3 See Appendix, note 368.
4 The grey matter forming the floor of the *anterior perforated space* is distinguished by the name of the *anterior perforated plate* or *lamina*. See also Appendix, note 362.
5 See Appendix, note 361. 6 See Appendix, note 327.
7 The grey matter forming the floor of the *posterior perforated space* is distinguished by the name of the *posterior perforated plate* or *lamina*.
8 *Seventh cranial nerve* in Soemmerring's enumeration, *portio dura* of the *seventh* in that of Willis.
9 *Eighth cranial nerve* in Soemmerring's enumeration, *portio mollis* of the *seventh* in that of Willis.
10 *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth cranial nerve* in that of Willis; also known as the *lingual motor nerve*.
11 Or *second cranial nerve*. 12 Also known as the *bulb of the fornix*. 13 See Appendix, note 363.

*Rhombencephalon, Mesencephalon, and Thalamencephalon.


Internal capsule
Capsula interna
Tail of the caudate nucleus[1]
Cauda nuclei caudati
Globus pallidus
External geniculate body
Corpus geniculatum externum
Internal geniculate body
Corpus geniculatum internum
Pulvinar, or posterior tubercle of the optic thalamus
Lateral groove or sulcus lateralis (mesencephali)[4]
Inferior (or posterior) brachium of the quadrigeminal bodies (1)
*Triangle of the fillet (lower or lateral fillet)[4]—*Trigonum lemnisci
Superior peduncle of the cerebellum, or brachium conjunctivum (crus cerebelli ad cerebrum)
Superior medullary velum, or valve of Vieussens (roof of the fourth ventricle) (2)
Fourth ventricle
Ventriculus quartus
Glossopharyngeal and pneumogastric nerves[5] (3)
Clava
Cuneate tubercle
Tuberculum cuneatum
Tubercle of Rolando—Tuberculum cinereum
Funiculus gracilis
Funiculus cuneatus
Anterior commissure
Commissura anterior
Head of the caudate nucleus[1]
Caput nuclei caudati
Anterior horn of the lateral ventricle
Cornu anterius ventriculi lateralis
Putamen
Optic tract
Tractus opticus
Optic nerve
N. opticus
Olfactory tract
Tractus olfactorius
Optic commissure or chiasma
Chiasma opticum
Corpus albicans seu mamillare[6]
Cerebral peduncle or crus cerebri—Pedunculus cerebri
Pons Varolii—Pons (Varoli)
Tænia pontis[2]—Fila lateralia pontis
Upper or oblique superficial transverse fibres of the pons
Fasciculus obliquus pontis
Middle peduncle of the cerebellum, or crus cerebelli ad pontem (4)
Flocculus
Olivary body or lower olive[3]—Oliva
External or superficial arched or arcuate fibres
Fibræ arcuatæ externæ
Bundles of the posterior root of the first cervical or suboccipital nerve (5)
Anterolateral groove—Sulcus lateralis posterior
Lateral column—Funiculus lateralis
1/1

(1) Brachium quadrigeminum inferius (2) Velum medullare anterius (tegmen ventriculi quarti) (3) Nn. glossopharyngeus et vagus
(4) Brachium pontis (5) Fasciculi radicis posterioris nervi cervicalis I.

FIG. 1175.—THE MEDULLA OBLONGATA, WITH THE PONS VAROLII; THE CEREBRAL PEDUNCLES OR CRURA CEREBRI (PEDUNCULI CEREBRI), WITH THE ADJOINING *TRIANGLE OF THE FILLET (*TRIGONUM LEMNISCI—*see Appendix, note* 389); THE QUADRIGEMINAL BODIES, CORPORA QUADRIGEMINA; THE PULVINAR, OR POSTERIOR TUBERCLE OF THE OPTIC THALAMUS; THE EXTERNAL AND INTERNAL GENICULATE BODIES, CORPUS GENICULATUM EXTERNUM ET CORPUS GENICULATUM INTERNUM; THE OPTIC TRACT (TRACTUS OPTICUS). SEEN FROM THE RIGHT SIDE.

The superior peduncle of the cerebellum, brachium conjunctivum, or crus cerebelli ad cerebrum, and the middle peduncle of the cerebellum, or crus cerebelli ad pontem (brachium pontis), were cut across at their junction with the cerebellum, of which last everything but the flocculus has been cut away. The preparation was separated from the right cerebral hemisphere by a section very nearly sagittal, passing through the caudate nucleus. The two parts of this nucleus, the head (caput) and the tail (cauda), are thus shown in sagittal section; by these the fibres (divided almost transversely) of the internal capsule (capsula interna, pedunculus coronæ radiatæ) are embraced above and behind; below the internal capsule are the globus pallidus and the putamen of the lenticular nucleus, and also the anterior commissure in transverse section.

[1] *Corpus Striatum.*—In England the *corpus striatum* is regarded as containing *two* nuclei, the *caudate nucleus* and the *lenticular nucleus*, quite frequently spoken of by their Latin names as *nucleus caudatus* and *nucleus lenticularis*, and sometimes also distinguished as the *intraventricular portion* (or *nucleus*) and *extraventricular portion* (or *nucleus*) of the *corpus striatum*. The corpora striata themselves are sometimes spoken of as the *ganglia of the cerebral hemispheres*. The anterior, larger extremity of the caudate nucleus is called the *head* or *caput*; the posterior, smaller extremity, the *tail* or *cauda*. Von Langer and Toldt regard the *lenticular nucleus* (*nucleus lentiformis*) as an independent mass of grey matter, not forming part of the *corpus striatum*. This latter, as it appears in the outer wall of the anterior horn of the lateral ventricle, the German authors divide into two portions: an anterior, **caput corporis striati*, and a posterior, **cauda corporis striati* (Fig. 1176, p. 767); but the corresponding English terms **head* and **tail of the corpus striatum* are not used by Quain. The *nucleus caudatus* is "the grey matter of the *corpus striatum*," and the names of the subdivisions of this nucleus, *caput nuclei caudati* and *cauda nuclei caudati* are applied by the German authors exactly as they are applied in England.

[2] *Tænia Pontis.*—Von Langer and Toldt describe in the following terms the fibres called by them the **lateral strands of the pons* (*op. cit.*, p. 615): "Not infrequently, at the upper margin of the pons Varolii, we see one or two slender separate bundles of fibres which run across the peduncles of the cerebrum to join the superior peduncles of the cerebellum; these are called *fila lateralia pontis*." The reference to these fibres in Quain's "Anatomy" (vol. iii., part i., p. 115) is very brief: "Some horizontal white striæ usually pass out of the grey matter [of the posterior perforated space] and turn round the peduncles [of the cerebrum] close to the upper border of the pons, entering which they reach eventually the medullary centre of the cerebellum (*tænia pontis*)."

[3] See Appendix, note 327. [4] See Appendix, note 369.

[5] The *glossopharyngeal* is the *ninth*, and the *pneumogastric* (or *vagus*) is the *tenth, cranial nerve* in Soemmerring's enumeration. In that of Willis they constitute the *first* and *second trunks*, respectively, of the *eighth cranial nerve*.

[6] Also known as the *bulb of the fornix*.

*Rhombencephalon, Mesencephalon, and Thalamencephalon.

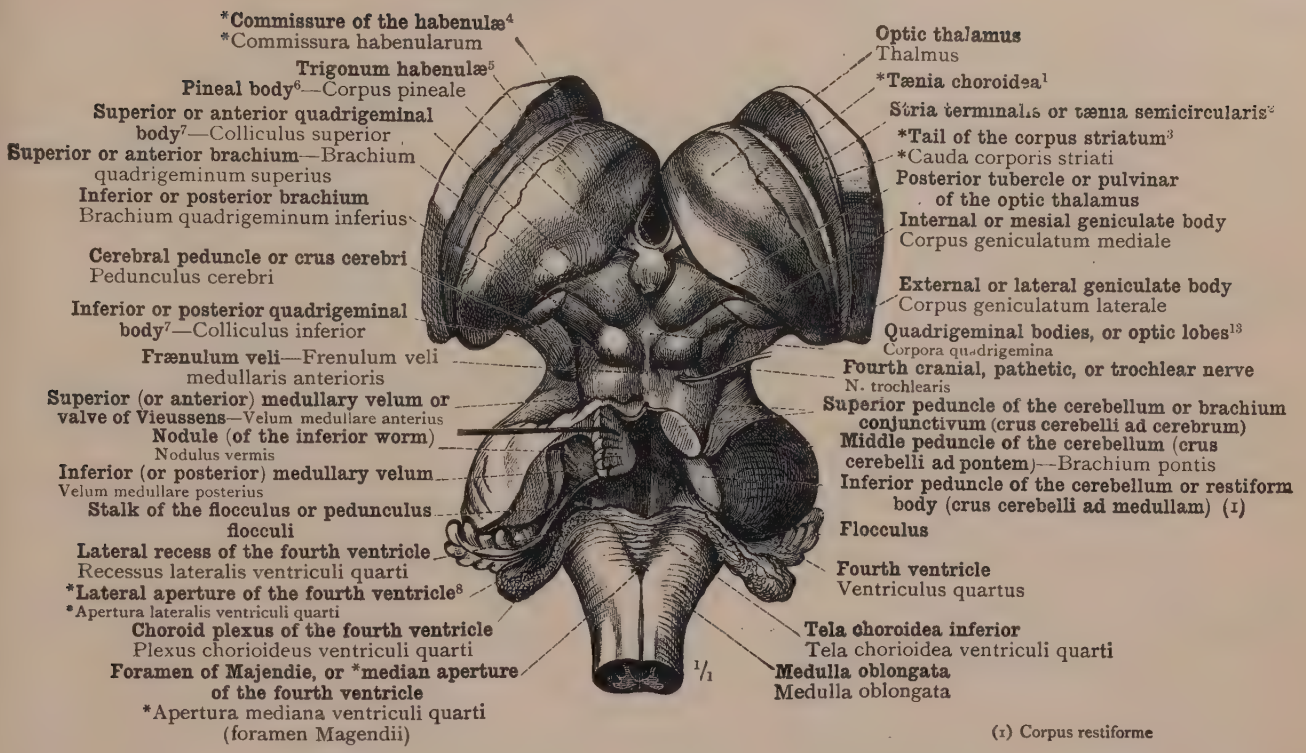

*Commissure of the habenulæ[4]
*Commissura habenularum
Trigonum habenulæ[5]
Pineal body[6]—Corpus pineale
Superior or anterior quadrigeminal body[7]—Colliculus superior
Superior or anterior brachium—Brachium quadrigeminum superius
Inferior or posterior brachium
Brachium quadrigeminum inferius
Cerebral peduncle or crus cerebri
Pedunculus cerebri
Inferior or posterior quadrigeminal body[7]—Colliculus inferior
Frænulum veli—Frenulum veli medullaris anterioris
Superior (or anterior) medullary velum or valve of Vieussens—Velum medullare anterius
Nodule (of the inferior worm)
Nodulus vermis
Inferior (or posterior) medullary velum
Velum medullare posterius
Stalk of the flocculus or pedunculus flocculi
Lateral recess of the fourth ventricle
Recessus lateralis ventriculi quarti
*Lateral aperture of the fourth ventricle[8]
*Apertura lateralis ventriculi quarti
Choroid plexus of the fourth ventricle
Plexus chorioideus ventriculi quarti
Foramen of Majendie, or *median aperture of the fourth ventricle
*Apertura mediana ventriculi quarti (foramen Magendii)
Optic thalamus
Thalmus
*Tænia choroidea[1]
Stria terminalis or tænia semicircularis[2]
*Tail of the corpus striatum[3]
*Cauda corporis striati
Posterior tubercle or pulvinar of the optic thalamus
Internal or mesial geniculate body
Corpus geniculatum mediale
External or lateral geniculate body
Corpus geniculatum laterale
Quadrigeminal bodies, or optic lobes[13]
Corpora quadrigemina
Fourth cranial, pathetic, or trochlear nerve
N. trochlearis
Superior peduncle of the cerebellum or brachium conjunctivum (crus cerebelli ad cerebrum)
Middle peduncle of the cerebellum (crus cerebelli ad pontem)—Brachium pontis
Inferior peduncle of the cerebellum or restiform body (crus cerebelli ad medullam) (1)
Flocculus
Fourth ventricle
Ventriculus quartus
Tela choroidea inferior
Tela chorioidea ventriculi quarti
Medulla oblongata
Medulla oblongata
1/1
(1) Corpus restiforme

FIG. 1176.—THE MEDULLA OBLONGATA, THE CORPORA QUADRIGEMINA OR OPTIC LOBES WITH THEIR BRACHIA, THE OPTIC THALAMI, AND THE INTERNAL AND EXTERNAL GENICULATE BODIES; SEEN FROM THE DORSAL SIDE.

The tela choroidea inferior (tela chorioidea ventriculi quarti), forming the roof of the lower part of the fourth ventricle, has been preserved; on either side, however, the outer part of the choroid plexuses of the fourth ventricle has been separated from the stalk of the flocculus or pedunculus flocculi (the outer thickened part of the lower free edge of the inferior, or posterior, medullary velum), and the lateral recesses of the fourth ventricle have thus been opened from behind. The upper part of the fourth ventricle has been opened by a median sagittal section through the worm of the cerebellum and part of the superior, or anterior, medullary velum or valve of Vieussens. The greater part of the cerebellum has been removed; the left half only of the nodulus with the flocculus and its stalk and the inferior, or posterior, medullary velum being retained.

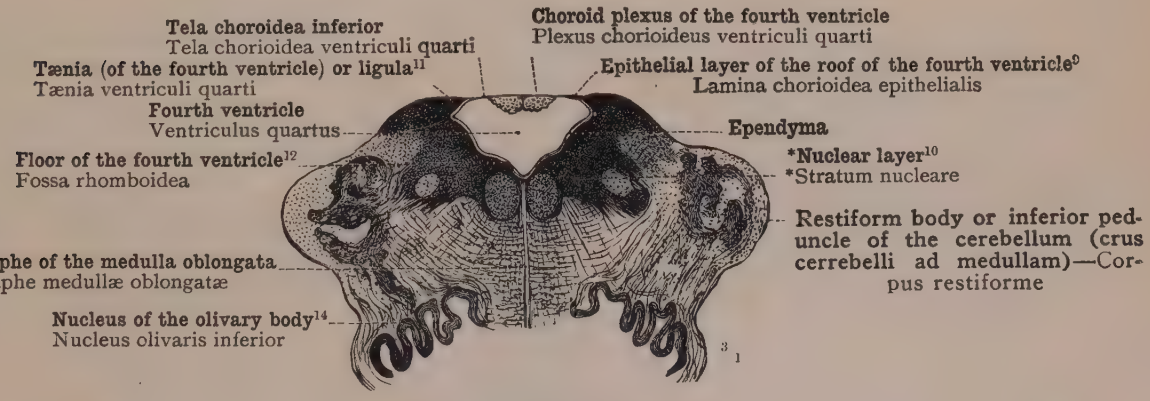

Tela choroidea inferior
Tela chorioidea ventriculi quarti
Tænia (of the fourth ventricle) or ligula[11]
Tænia ventriculi quarti
Fourth ventricle
Ventriculus quartus
Floor of the fourth ventricle[12]
Fossa rhomboidea
Raphe of the medulla oblongata
Raphe medullæ oblongatæ
Nucleus of the olivary body[14]
Nucleus olivaris inferior
Choroid plexus of the fourth ventricle
Plexus chorioideus ventriculi quarti
Epithelial layer of the roof of the fourth ventricle[9]
Lamina chorioidea epithelialis
Ependyma
*Nuclear layer[10]
*Stratum nucleare
Restiform body or inferior peduncle of the cerebellum (crus cerebelli ad medullam)—Corpus restiforme
3/1

FIG 1177.—THE LOWER PART OF THE FOURTH VENTRICLE, VENTRICULUS QUARTUS, IN CORONAL SECTION (SEMIDIAGRAMMATIC).

1 See Appendix, note 370. 2 See note 1 to p. 784.
3 *I.e.*, surface of the tail of the caudate nucleus as it appears in the wall of the lateral ventricle. See note 1 to p. 766.
4 See Appendix, note 371. 5 See Appendix, note 365.
6 Known also as the *pineal gland*, the *conarium*, and the *epiphysis cerebri*. See Appendix, note 365.
7 See Appendix, note 372. 8 See Appendix, note 373. 9 See Appendix, note 374.
10 See Appendix, note 375. 11 See note 1 to p. 784. 12 See Appendix, note 355.
13 See note 5 to p. 760. 14 See Appendix, note 385.

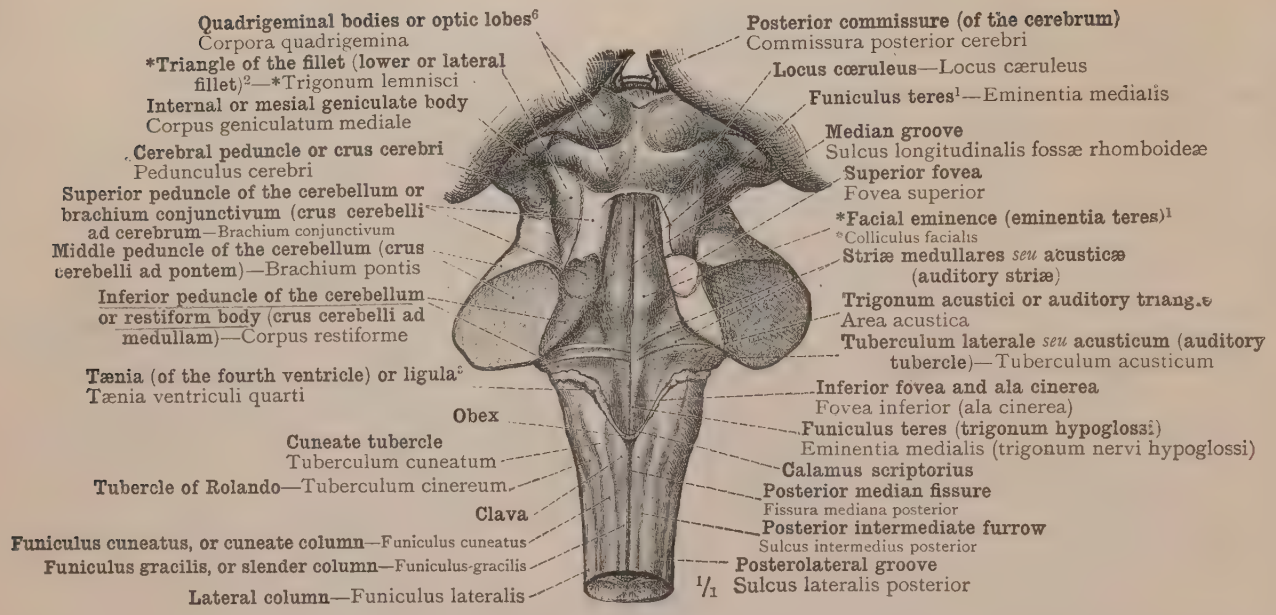

Quadrigeminal bodies or optic lobes[6]
Corpora quadrigemina
*Triangle of the fillet (lower or lateral fillet)[2]—*Trigonum lemnisci
Internal or mesial geniculate body
Corpus geniculatum mediale
Cerebral peduncle or crus cerebri
Pedunculus cerebri
Superior peduncle of the cerebellum or brachium conjunctivum (crus cerebelli ad cerebrum—Brachium conjunctivum
Middle peduncle of the cerebellum (crus cerebelli ad pontem)—Brachium pontis
Inferior peduncle of the cerebellum or restiform body (crus cerebelli ad medullam)—Corpus restiforme
Tænia (of the fourth ventricle) or ligula[5]
Tænia ventriculi quarti
Obex
Cuneate tubercle
Tuberculum cuneatum
Tubercle of Rolando—Tuberculum cinereum
Clava
Funiculus cuneatus, or cuneate column—Funiculus cuneatus
Funiculus gracilis, or slender column—Funiculus gracilis
Lateral column—Funiculus lateralis
Posterior commissure (of the cerebrum)
Commissura posterior cerebri
Locus cœruleus—Locus cæruleus
Funiculus teres[1]—Eminentia medialis
Median groove
Sulcus longitudinalis fossæ rhomboideæ
Superior fovea
Fovea superior
*Facial eminence (eminentia teres)[1]
*Colliculus facialis
Striæ medullares seu acusticæ (auditory striæ)
Trigonum acustici or auditory triang.e
Area acustica
Tuberculum laterale seu acusticum (auditory tubercle)—Tuberculum acusticum
Inferior fovea and ala cinerea
Fovea inferior (ala cinerea)
Funiculus teres (trigonum hypoglossi)
Eminentia medialis (trigonum nervi hypoglossi)
Calamus scriptorius
Posterior median fissure
Fissura mediana posterior
Posterior intermediate furrow
Sulcus intermedius posterior
Posterolateral groove
Sulcus lateralis posterior
1/1

FIG. 1178.—THE FLOOR OF THE FOURTH VENTRICLE (FOSSA RHOMBOIDEA—*see Appendix, note* [355]), DISPLAYED BY THE REMOVAL OF THE POSTERIOR WALL (ROOF) OF THE VENTRICLE AND ALSO OF THE CEREBELLUM. THE VENTRICLE IS SEEN TO BE BOUNDED LATERALLY BY THE RESTIFORM BODIES BELOW, AND BY THE SUPERIOR PEDUNCLES OF THE CEREBELLUM ABOVE; AND THE CONTINUITY OF ITS WALLS WITH THE SUBSTANCE OF THE MID-BRAIN IS MANIFEST.

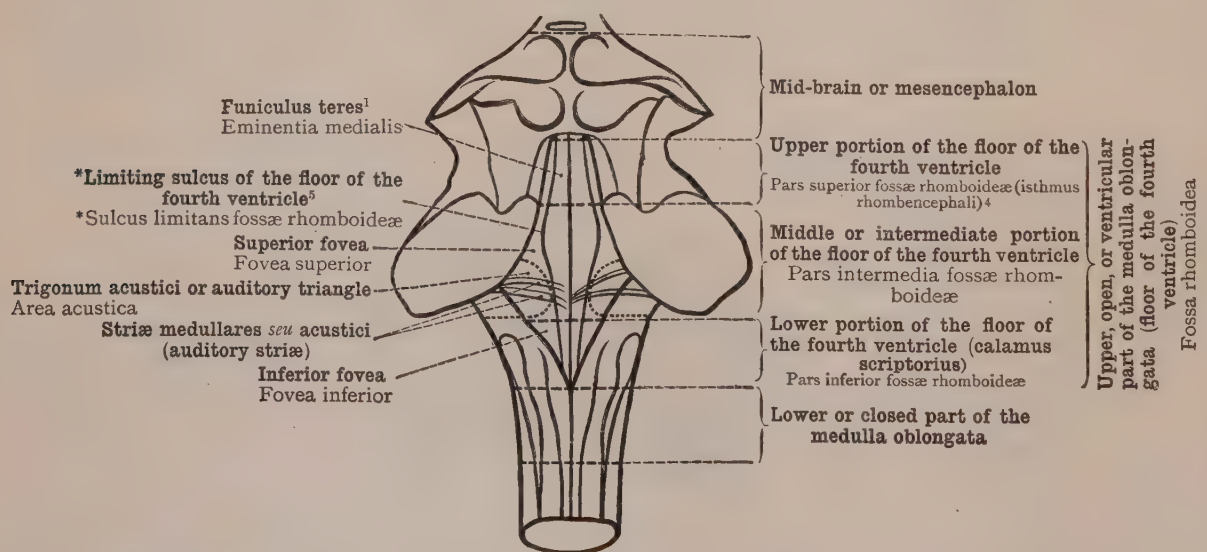

Funiculus teres[1]
Eminentia medialis
*Limiting sulcus of the floor of the fourth ventricle[5]
*Sulcus limitans fossæ rhomboideæ
Superior fovea
Fovea superior
Trigonum acustici or auditory triangle
Area acustica
Striæ medullares seu acustici (auditory striæ)
Inferior fovea
Fovea inferior
Mid-brain or mesencephalon
Upper portion of the floor of the fourth ventricle
Pars superior fossæ rhomboideæ (isthmus rhombencephali)[4]
Middle or intermediate portion of the floor of the fourth ventricle
Pars intermedia fossæ rhomboideæ
Lower portion of the floor of the fourth ventricle (calamus scriptorius)
Pars inferior fossæ rhomboideæ
Lower or closed part of the medulla oblongata
Upper, open, or ventricular part of the medulla oblongata (floor of the fourth ventricle)
Fossa rhomboidea

FIG. 1179.—SUBDIVISIONS OF THE MEDULLA OBLONGATA AND THE FLOOR OF THE FOURTH VENTRICLE (DIAGRAMMATIC).

[1] See Appendix, note 376. [2] See Appendix, note 369. [3] See note [1] to p. 784.
[4] See Appendix, note 369. [5] See Appendix, note 377. [6] See note [5] to p. 760.

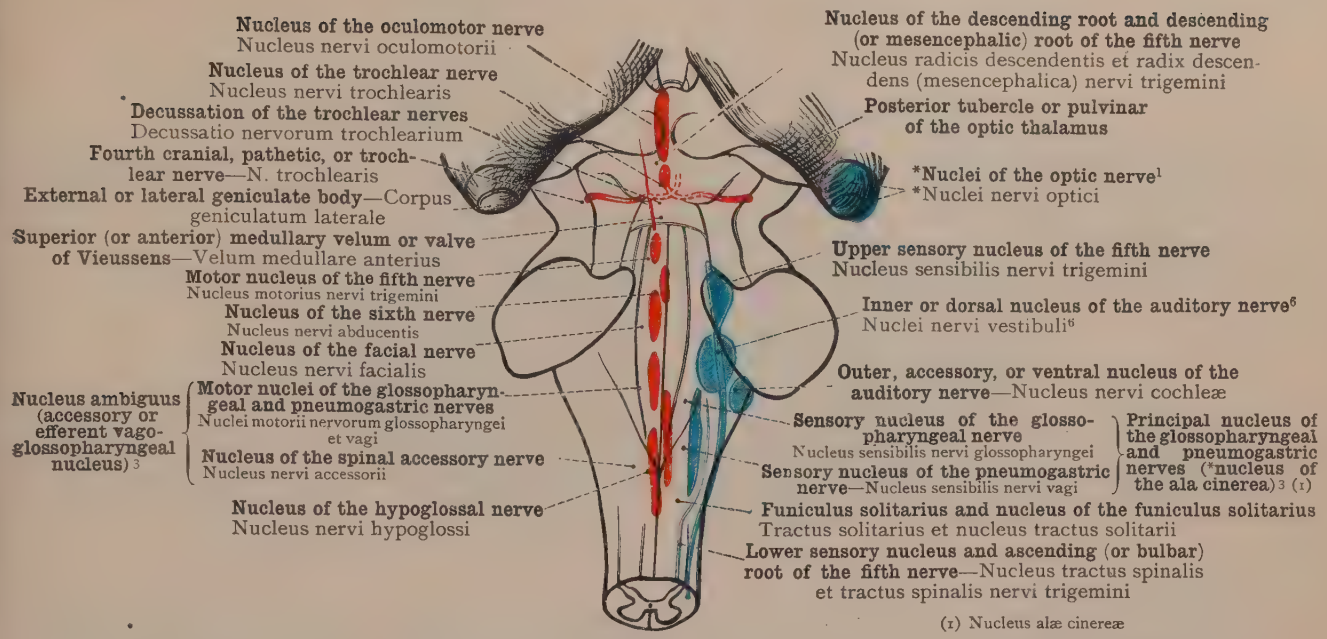

Nucleus of the oculomotor nerve
Nucleus nervi oculomotorii
Nucleus of the trochlear nerve
Nucleus nervi trochlearis
Decussation of the trochlear nerves
Decussatio nervorum trochlearium
Fourth cranial, pathetic, or trochlear nerve—N. trochlearis
External or lateral geniculate body—Corpus geniculatum laterale
Superior (or anterior) medullary velum or valve of Vieussens—Velum medullare anterius
Motor nucleus of the fifth nerve
Nucleus motorius nervi trigemini
Nucleus of the sixth nerve
Nucleus nervi abducentis
Nucleus of the facial nerve
Nucleus nervi facialis
Nucleus ambiguus (accessory or efferent vago-glossopharyngeal nucleus) 3
Motor nuclei of the glossopharyngeal and pneumogastric nerves
Nuclei motorii nervorum glossopharyngei et vagi
Nucleus of the spinal accessory nerve
Nucleus nervi accessorii
Nucleus of the hypoglossal nerve
Nucleus nervi hypoglossi
Nucleus of the descending root and descending (or mesencephalic) root of the fifth nerve
Nucleus radicis descendentis et radix descendens (mesencephalica) nervi trigemini
Posterior tubercle or pulvinar of the optic thalamus
*Nuclei of the optic nerve[1]
*Nuclei nervi optici
Upper sensory nucleus of the fifth nerve
Nucleus sensibilis nervi trigemini
Inner or dorsal nucleus of the auditory nerve[6]
Nuclei nervi vestibuli[6]
Outer, accessory, or ventral nucleus of the auditory nerve—Nucleus nervi cochleæ
Sensory nucleus of the glossopharyngeal nerve
Nucleus sensibilis nervi glossopharyngei
Sensory nucleus of the pneumogastric nerve—Nucleus sensibilis nervi vagi
Principal nucleus of the glossopharyngeal and pneumogastric nerves (*nucleus of the ala cinerea) 3 (1)
Funiculus solitarius and nucleus of the funiculus solitarius
Tractus solitarius et nucleus tractus solitarii
Lower sensory nucleus and ascending (or bulbar) root of the fifth nerve—Nucleus tractus spinalis et tractus spinalis nervi trigemini
(1) Nucleus alæ cinereæ

FIG. 1180.—THE NUCLEI OF ORIGIN OF THE CRANIAL NERVES, NUCLEI ORIGINIS NERVORUM CEREBRALIUM, IN THE *RHOMBENCEPHALON AND MESENCEPHALON; SEEN FROM BEHIND, IN DIAGRAMMATIC PROJECTION.

The efferent or motor nuclei are represented on the left side only, and are coloured red; the afferent or sensory nuclei are represented on the right side only and are coloured blue.

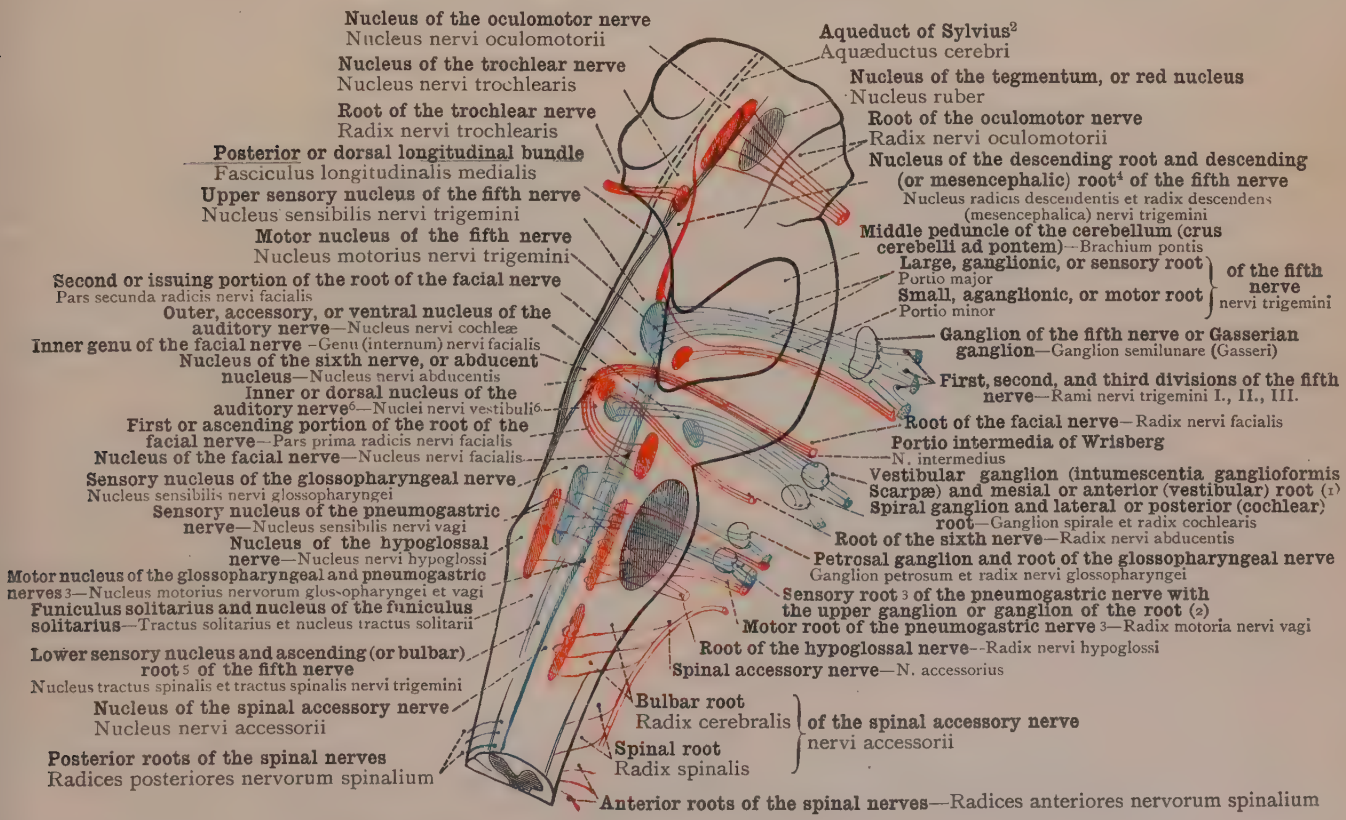

Nucleus of the oculomotor nerve
Nucleus nervi oculomotorii
Nucleus of the trochlear nerve
Nucleus nervi trochlearis
Root of the trochlear nerve
Radix nervi trochlearis
Posterior or dorsal longitudinal bundle
Fasciculus longitudinalis medialis
Upper sensory nucleus of the fifth nerve
Nucleus sensibilis nervi trigemini
Motor nucleus of the fifth nerve
Nucleus motorius nervi trigemini
Second or issuing portion of the root of the facial nerve
Pars secunda radicis nervi facialis
Outer, accessory, or ventral nucleus of the auditory nerve—Nucleus nervi cochleæ
Inner genu of the facial nerve—Genu (internum) nervi facialis
Nucleus of the sixth nerve, or abducent nucleus—Nucleus nervi abducentis
Inner or dorsal nucleus of the auditory nerve[6]—Nuclei nervi vestibuli[6]
First or ascending portion of the root of the facial nerve—Pars prima radicis nervi facialis
Nucleus of the facial nerve—Nucleus nervi facialis
Sensory nucleus of the glossopharyngeal nerve
Nucleus sensibilis nervi glossopharyngei
Sensory nucleus of the pneumogastric nerve—Nucleus sensibilis nervi vagi
Nucleus of the hypoglossal nerve—Nucleus nervi hypoglossi
Motor nucleus of the glossopharyngeal and pneumogastric nerves 3—Nucleus motorius nervorum glossopharyngei et vagi
Funiculus solitarius and nucleus of the funiculus solitarius—Tractus solitarius et nucleus tractus solitarii
Lower sensory nucleus and ascending (or bulbar) root 5 of the fifth nerve
Nucleus tractus spinalis et tractus spinalis nervi trigemini
Nucleus of the spinal accessory nerve
Nucleus nervi accessorii
Posterior roots of the spinal nerves
Radices posteriores nervorum spinalium
Aqueduct of Sylvius[2]
Aquæductus cerebri
Nucleus of the tegmentum, or red nucleus
Nucleus ruber
Root of the oculomotor nerve
Radix nervi oculomotorii
Nucleus of the descending root and descending (or mesencephalic) root[4] of the fifth nerve
Nucleus radicis descendentis et radix descendens (mesencephalica) nervi trigemini
Middle peduncle of the cerebellum (crus cerebelli ad pontem)—Brachium pontis
Large, ganglionic, or sensory root
Portio major
Small, aganglionic, or motor root
Portio minor
of the fifth nerve
nervi trigemini
Ganglion of the fifth nerve or Gasserian ganglion—Ganglion semilunare (Gasseri)
First, second, and third divisions of the fifth nerve—Rami nervi trigemini I., II., III.
Root of the facial nerve—Radix nervi facialis
Portio intermedia of Wrisberg
N. intermedius
Vestibular ganglion (intumescentia ganglioformis Scarpæ) and mesial or anterior (vestibular) root (1)
Spiral ganglion and lateral or posterior (cochlear) root—Ganglion spirale et radix cochlearis
Root of the sixth nerve—Radix nervi abducentis
Petrosal ganglion and root of the glossopharyngeal nerve
Ganglion petrosum et radix nervi glossopharyngei
Sensory root 3 of the pneumogastric nerve with the upper ganglion or ganglion of the root (2)
Motor root of the pneumogastric nerve 3—Radix motoria nervi vagi
Root of the hypoglossal nerve—Radix nervi hypoglossi
Spinal accessory nerve—N. accessorius
Bulbar root
Radix cerebralis
Spinal root
Radix spinalis
of the spinal accessory nerve
nervi accessorii
Anterior roots of the spinal nerves—Radices anteriores nervorum spinalium
(1) Ganglion vestibulare et radix vestibularis
(2) Ganglion jugulare et radix sensibilis nervi vagi

FIG. 1181.—THE NUCLEI OF ORIGIN OF THE CRANIAL NERVES, NUCLEI ORIGINIS NERVORUM CEREBRALIUM, IN THE *RHOMBENCEPHALON AND MESENCEPHALON; SEEN FROM THE SIDE IN DIAGRAMMATIC PROJECTION.

The efferent or motor nuclei and roots are coloured red; the afferent or sensory nuclei and roots are coloured blue.

1 See Appendix, note 378. 2 Or *iter a tertio ad quartum ventriculum.* 3 See Appendix, note 379.
4 Called by Gowers the *upper root.* 5 Called by Gowers the *lower root.*
6 *Nuclei Nervi Vestibuli.*—The author uses the term *nuclei* in the plural because, according to his view, "the *vestibular root* of the auditory nerve passes chiefly to the *nucleus of Deiters*, but in part also to the *dorsal nucleus*" (Von Langer and Toldt, *op. cit.*, p. 649). According to Quain, on the other hand, most of the fibres of the vestibular root pass to the dorsal nucleus, and the connexion of this root with the nucleus of Deiters is doubtful.

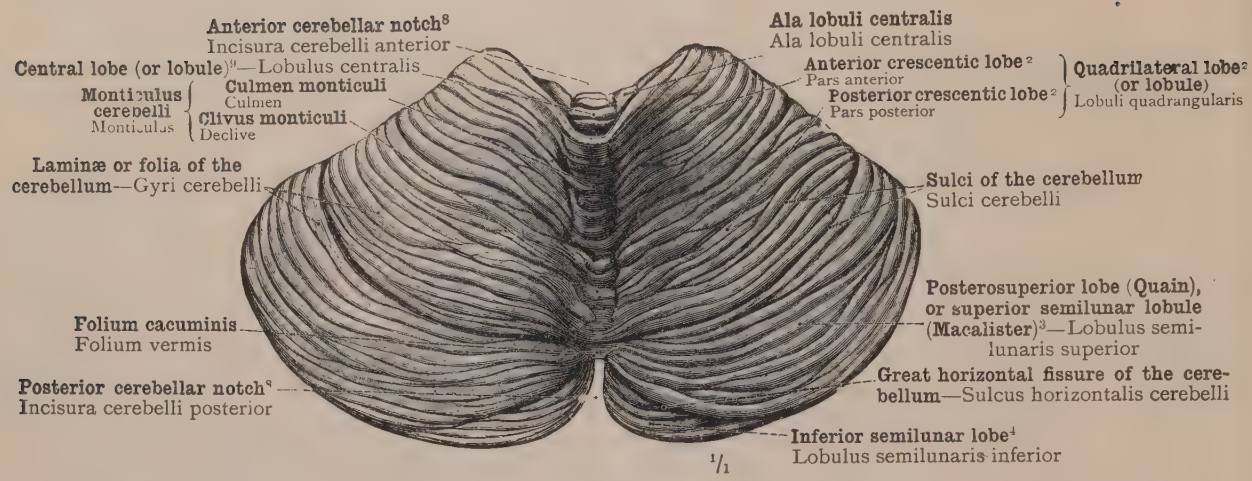
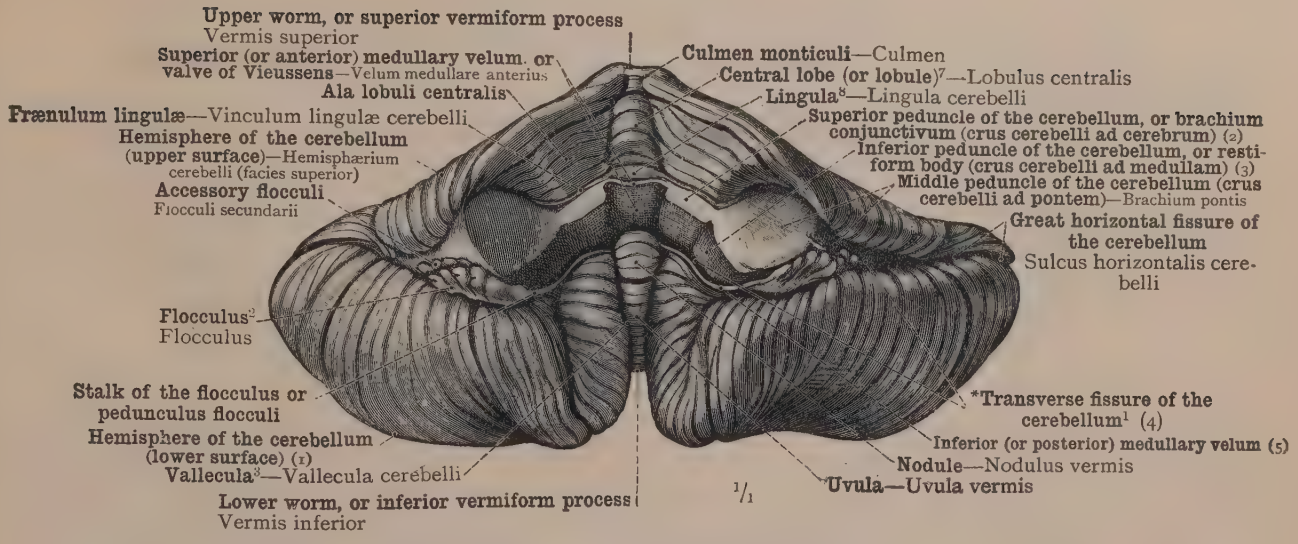


FIG. 1182.—THE CEREBELLUM, SEPARATED FROM ITS ATTACHMENTS. UPPER SURFACE, FACIES SUPERIOR. THE SUBDIVISION OF THE UPPER WORM OR SUPERIOR VERMIFORM PROCESS (VERMIS SUPERIOR) INTO THE CENTRAL LOBE OR LOBULE (LOBULUS CENTRALIS), THE MONTICULUS—CONSISTING OF AN ANTERIOR PART OR CULMEN AND A POSTERIOR PART OR CLIVUS (DECLIVE)—AND THE FOLIUM CACUMINIS (FOLIUM VERMIS). THE SUBDIVISION OF THE HEMISPHERES (HEMISPHERIA CEREBELLI) INTO THE ALA LOBULI CENTRALIS, THE QUADRILATERAL LOBE (LOBULUS QUADRANGULARIS[2]), AND THE POSTEROSUPERIOR LOBE OR SUPERIOR SEMILUNAR LOBULE (LOBULUS SEMILUNARIS SUPERIOR[3]).[1]

Regarding the nomenclature of the parts of the cerebellum in general, *see Appendix, note* 380.

FIG. 1183.—THE INFERIOR SURFACE OF THE CEREBELLUM, FACIES INFERIOR CEREBELLI. THE SUBDIVISION OF THE LOWER WORM OR INFERIOR VERMIFORM PROCESS (VERMIS INFERIOR) INTO THE TUBER VALVULÆ SEU TUBER POSTICUM (TUBER VERMIS), THE PYRAMID (PYRAMIS VERMIS), THE UVULA (UVULA VERMIS), AND THE NODULE (NODULUS VERMIS). THE SUBDIVISION OF THE HEMISPHERES (HEMISPHÆRIA CEREBELLI) INTO THE INFERIOR SEMILUNAR LOBE OR MARGINAL LOBULE (LOBULUS SEMILUNARIS INFERIOR[4]), THE BIVENTRAL LOBE OR CUNEIFORM OR DIGASTRIC LOBULE (LOBULUS BIVENTER), THE TONSIL OR AMYGDALA (TONSILLA CEREBELLI[6]), AND THE FLOCCULUS OR SUBPEDUNCULAR LOBE (FLOCCULUS).[1]

1 See Appendix, note 380. 2 See Appendix, note 381.
3 Ellis (*op. cit.*) calls this the *posterior lobe* (of the upper surface)
4 Called by Macalister the *marginal lobule*, and by Ellis the *posterior lobe* (of the under surface). See also Appendix, note 380.
5 Ellis gives *subpeduncular lobe* as an alternative name for the *flocculus*.
6 The *tonsil* or *amygdala* of the cerebellum is by Macalister called the *tonsillitic lobe*, and by Ellis the *amygdaloid lobe*.
7 By Macalister called the *cuneiform* or *digastric lobule*. See also Appendix, note 380.
8 *Cerebellar Notches.*—Alternative names for these are given by Quain—viz., for the *posterior notch, incisura marsupialis;* and for the *anterior notch, incisura semilunaris.*
9 See Appendix, note 382.


Upper worm, or superior vermiform process
Vermis superior
Superior (or anterior) medullary velum, or valve of Vieussens—Velum medullare anterius
Ala lobuli centralis
Frænulum linguæ—Vinculum linguæ cerebelli
Hemisphere of the cerebellum (upper surface)—Hemisphærium cerebelli (facies superior)
Accessory flocculi
Flocculi secundarii
Culmen monticuli—Culmen
Central lobe (or lobule)[7]—Lobulus centralis
Lingula[8]—Lingula cerebelli
Superior peduncle of the cerebellum, or brachium conjunctivum (crus cerebelli ad cerebrum) (2)
Inferior peduncle of the cerebellum, or restiform body (crus cerebelli ad medullam) (3)
Middle peduncle of the cerebellum (crus cerebelli ad pontem)—Brachium pontis
Great horizontal fissure of the cerebellum
Sulcus horizontalis cerebelli
Flocculus[2]
Flocculus
Stalk of the flocculus or pedunculus flocculi
Hemisphere of the cerebellum (lower surface) (1)
Vallecula[3]—Vallecula cerebelli
Lower worm, or inferior vermiform process
Vermis inferior
*Transverse fissure of the cerebellum[1] (4)
Inferior (or posterior) medullary velum (5)
Nodule—Nodulus vermis
Uvula—Uvula vermis
1/1

(1) Hemisphærium cerebelli (facies inferior) (2) Brachium conjunctivum (3) Corpus restiforme
(4) *Fissura transversa cerebelli (5) Velum medullare posterius

FIG. 1184.—THE CEREBELLUM, SEPARATED FROM ITS ATTACHMENTS, SEEN FROM BEFORE. THE ENTRANCE OF THE THREE PAIRS OF CEREBELLAR PEDUNCLES (VIZ., THE MIDDLE PEDUNCLES, BRACHIA PONTIS, THE INFERIOR PEDUNCLES, CORPORA RESTIFORMIA, AND THE SUPERIOR PEDUNCLES, BRACHIA CONJUNCTIVA, WITH THE SUPERIOR MEDULLARY VELUM OR VALVE OF VIEUSSENS) INTO THE MEDULLARY CENTRE OF THE CEREBELLUM THROUGH THE *TRANSVERSE FISSURE OF THE CEREBELLUM, *FISSURA TRANSVERSA CEREBELLI (*i.e.*, THE ANTERIOR PART OF THE GREAT HORIZONTAL FISSURE[1]). THE LINGULA OF THE UPPER WORM, LINGULA CEREBELLI, WITH ITS LATERAL EXTENSIONS, FRÆNULA LINGULÆ (VINCULA LINGULÆ CEREBELLI).

Regarding the nomenclature of the parts of the cerebellum, *see Appendix, note* 380.

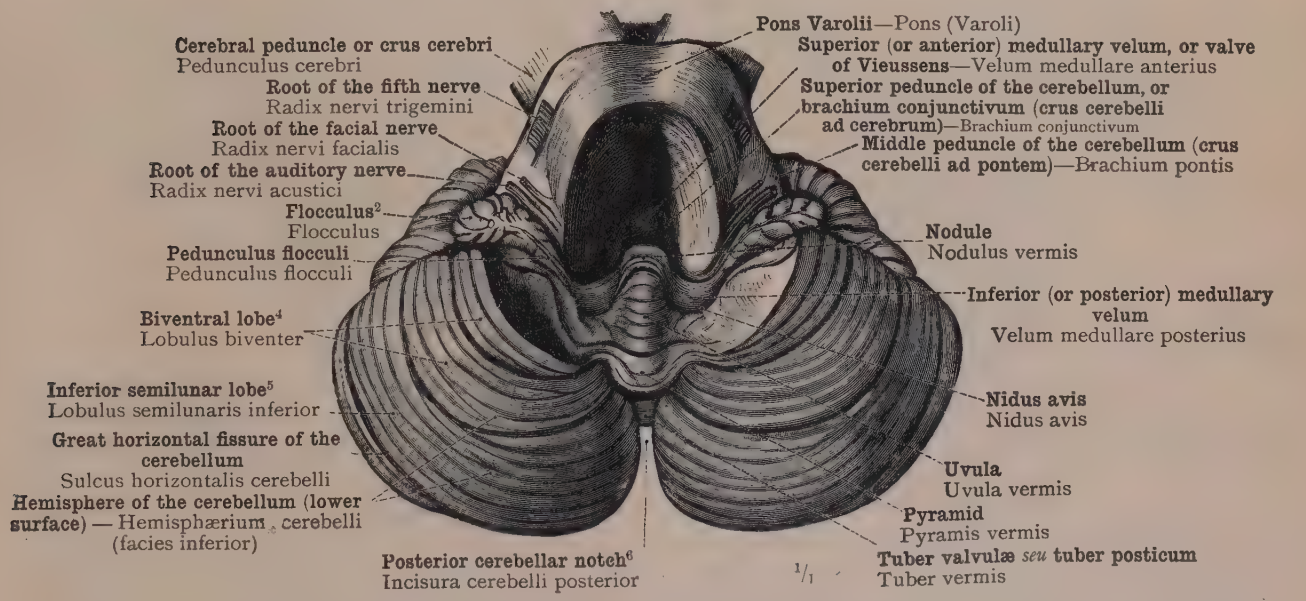


FIG. 1185.—THE LOWER SURFACE OF THE CEREBELLUM WITH THE PONS VAROLII. BY THE REMOVAL OF A PORTION OF THE LATTER, THE LOWER SURFACE OF THE SUPERIOR (OR ANTERIOR) MEDULLARY VELUM OR VALVE OF VIEUSSENS (VELUM MEDULLARE ANTERIUS) HAS BEEN EXPOSED; AND BY SHELLING OUT THE TONSIL (AMYGDALA) THE INFERIOR (OR POSTERIOR) MEDULLARY VELUM (VELUM MEDULLARE POSTERIUS), WITH THE PEDUNCULUS FLOCCULI, HAS BEEN LAID BARE (*see Appendix, note* 380).

1 See Appendix, note 383. 2 Or *subpeduncular lobe* (Ellis).
3 *Vallecula.*—Macalister makes use of the English equivalent, *valley*, for this median fossa.
4 By Macalister called the *cuneiform* or *digastric lobule.* See also Appendix, note 380.
5 Called by Macalister the *marginal lobule*, and by Ellis the *posterior lobe* (of the under surface). See also Appendix, note 380.
6 See note 9 to p. 770. 7 See Appendix, note 382. 8 Or *linguetta laminosa* (Macalister).

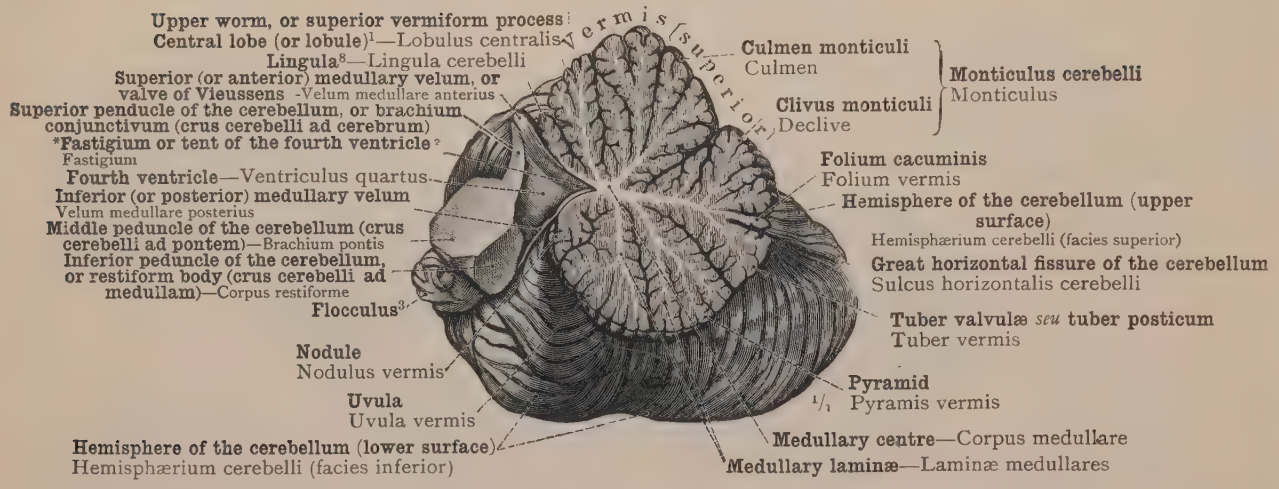


FIG. 1186.—MEDIAN SAGITTAL SECTION THROUGH THE WORM OR VERMIFORM PROCESS (VERMIS) OF THE CEREBELLUM. THE SUBDIVISIONS OF THE UPPER WORM OR SUPERIOR VERMIFORM PROCESS (VERMIS SUPERIOR) AND THE LOWER WORM OR INFERIOR VERMIFORM PROCESS (VERMIS INFERIOR). THE CONTINUITY OF THE SUPERIOR (OR ANTERIOR) MEDULLARY VELUM OR VALVE OF VIEUSSENS WITH THE MEDULLARY CENTRE OF THE WORM. THE TENT-SHAPED PROJECTION (*FASTIGIUM—*see Appendix, note* [366]) IN THE ROOF OF THE FOURTH VENTRICLE.

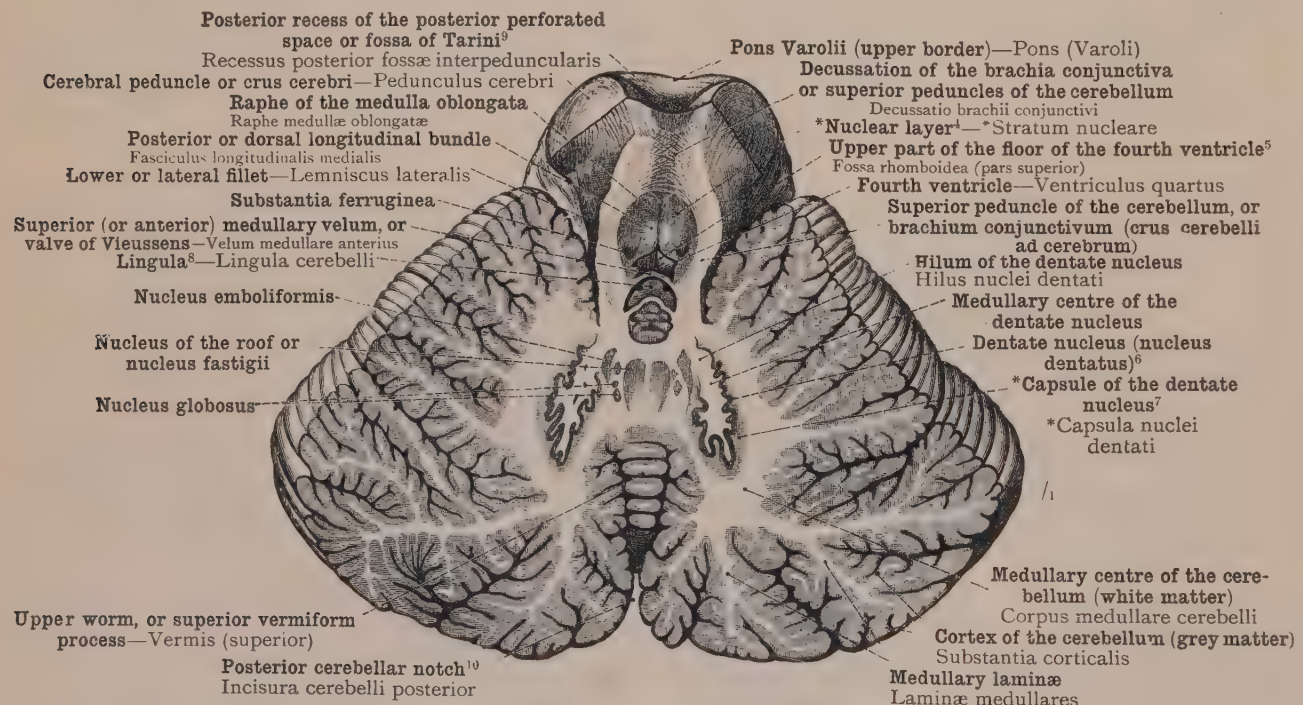
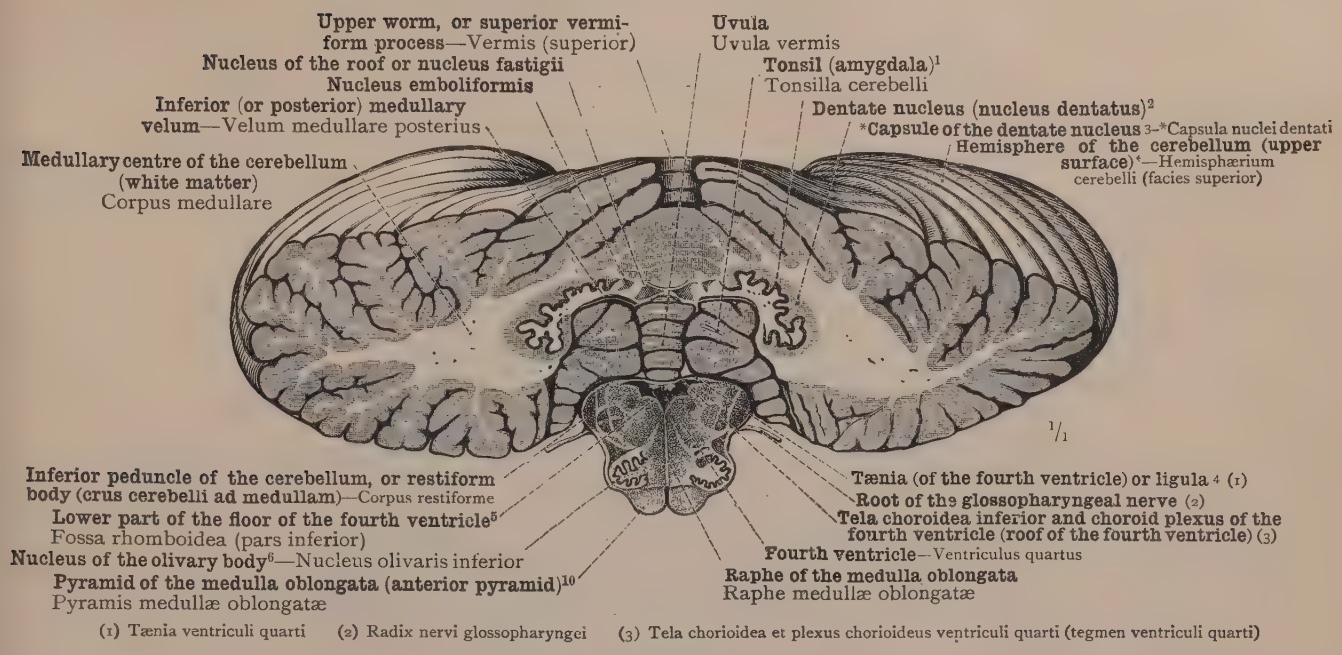

Posterior recess of the posterior perforated space or fossa of Tarini[9]
Recessus posterior fossæ interpeduncularis
Cerebral peduncle or crus cerebri—Pedunculus cerebri
Raphe of the medulla oblongata
Raphe medullæ oblongatæ
Posterior or dorsal longitudinal bundle
Fasciculus longitudinalis medialis
Lower or lateral fillet—Lemniscus lateralis
Substantia ferruginea
Superior (or anterior) medullary velum, or valve of Vieussens—Velum medullare anterius
Lingula[8]—Lingula cerebelli
Nucleus emboliformis
Nucleus of the roof or nucleus fastigii
Nucleus globosus
Upper worm, or superior vermiform process—Vermis (superior)
Posterior cerebellar notch[10]
Incisura cerebelli posterior
Pons Varolii (upper border)—Pons (Varoli)
Decussation of the brachia conjunctiva or superior peduncles of the cerebellum
Decussatio brachii conjunctivi
*Nuclear layer[4]—*Stratum nucleare
Upper part of the floor of the fourth ventricle[5]
Fossa rhomboidea (pars superior)
Fourth ventricle—Ventriculus quartus
Superior peduncle of the cerebellum, or brachium conjunctivum (crus cerebelli ad cerebrum)
Hilum of the dentate nucleus
Hilus nuclei dentati
Medullary centre of the dentate nucleus
Dentate nucleus (nucleus dentatus)[6]
*Capsule of the dentate nucleus[7]
*Capsula nuclei dentati
Medullary centre of the cerebellum (white matter)
Corpus medullare cerebelli
Cortex of the cerebellum (grey matter)
Substantia corticalis
Medullary laminæ
Laminæ medullares

FIG. 1187.—SECTION THROUGH THE CEREBELLUM AND THE PEDUNCLES OF THE CEREBRUM IN THE PLANE OF THE BRACHIA CONJUNCTIVA OR SUPERIOR PEDUNCLES OF THE CEREBELLUM. UPPER SURFACE OF LOWER SEGMENT. THE MEDULLARY CENTRE OR WHITE MATTER AND THE MEDULLARY LAMINÆ OF THE HEMISPHERES OF THE CEREBELLUM. THE NUCLEI OF THE WHITE MATTER OF THE CEREBELLUM: THE DENTATE NUCLEUS, NUCLEUS DENTATUS (CORPUS DENTATUS, CORPUS CILIARE); THE NUCLEUS EMBOLIFORMIS; THE NUCLEUS GLOBOSUS; AND THE NUCLEUS FASTIGII. THE DECUSSATION OF THE SUPERIOR PEDUNCLES OF THE CEREBELLUM, DECUSSATIO BRACHII CONJUNCTIVI.[11]

Regarding the nomenclature of the parts of the cerebellum, *see Appendix, note* [380].

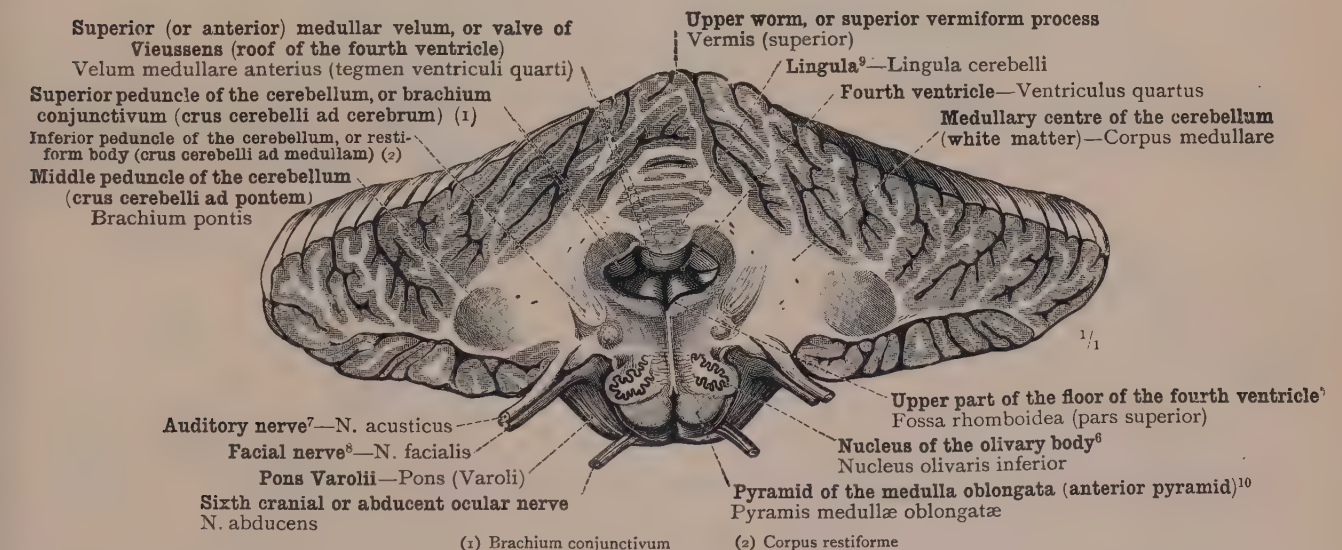
1 See Appendix, note [382].
2 See Appendix, note [366].
3 Or *subpeduncular lobe* (Ellis).
4 See Appendix, note 375.
5 See Appendix, note 355.
6 Known also as the *corpus dentatum* or *corpus ciliare*.
7 See Appendix, note [384].
8 Or *linguetta laminosa* (Macalister).
9 See Appendix, note [362].
10 See note [8] to p. 770.
11 *Decussatio Brachii Conjunctivi.*—Thus in the original. Since, however, a *single brachium* cannot *decussate*, the name should be *decussatio brachiorum conjunctivorum.*

The Cerebellum.


Upper worm, or superior vermiform process—Vermis (superior)
Uvula
Uvula vermis
Nucleus of the roof or nucleus fastigii
Nucleus emboliformis
Tonsil (amygdala)[1]
Tonsilla cerebelli
Inferior (or posterior) medullary velum—Velum medullare posterius
Dentate nucleus (nucleus dentatus)[2]
*Capsule of the dentate nucleus [3]–*Capsula nuclei dentati
Hemisphere of the cerebellum (upper surface)[4]—Hemisphærium cerebelli (facies superior)
Medullary centre of the cerebellum (white matter)
Corpus medullare
1/1
Inferior peduncle of the cerebellum, or restiform body (crus cerebelli ad medullam)—Corpus restiforme
Lower part of the floor of the fourth ventricle[5]
Fossa rhomboidea (pars inferior)
Nucleus of the olivary body[6]—Nucleus olivaris inferior
Pyramid of the medulla oblongata (anterior pyramid)[10]
Pyramis medullæ oblongatæ
Tænia (of the fourth ventricle) or ligula [4] (1)
Root of the glossopharyngeal nerve (2)
Tela choroidea inferior and choroid plexus of the fourth ventricle (roof of the fourth ventricle) (3)
Fourth ventricle—Ventriculus quartus
Raphe of the medulla oblongata
Raphe medullæ oblongatæ

(1) Tænia ventriculi quarti (2) Radix nervi glossopharyngei (3) Tela chorioidea et plexus chorioideus ventriculi quarti (tegmen ventriculi quarti)

FIG. 1188.—CORONAL SECTION THROUGH THE CEREBELLUM AND THE MEDULLA OBLONGATA IN THE REGION OF THE RESTIFORM BODIES (INFERIOR PEDUNCLES OF THE CEREBELLUM, CRURA CEREBELLI AD MEDULLAM); THE RESPECTIVE RELATIONS OF THE MEDULLA AND THE CEREBELLUM TO THE LOWER PART OF THE FOURTH VENTRICLE. THE NUCLEI OF THE WHITE MATTER OF THE CEREBELLUM.


Superior (or anterior) medullar velum, or valve of Vieussens (roof of the fourth ventricle)
Velum medullare anterius (tegmen ventriculi quarti)
Upper worm, or superior vermiform process
Vermis (superior)
Lingula[9]—Lingula cerebelli
Superior peduncle of the cerebellum, or brachium conjunctivum (crus cerebelli ad cerebrum) (1)
Fourth ventricle—Ventriculus quartus
Medullary centre of the cerebellum (white matter)—Corpus medullare
Inferior peduncle of the cerebellum, or restiform body (crus cerebelli ad medullam) (2)
Middle peduncle of the cerebellum (crus cerebelli ad pontem)
Brachium pontis
1/1
Upper part of the floor of the fourth ventricle[5]
Fossa rhomboidea (pars superior)
Auditory nerve[7]—N. acusticus
Facial nerve[8]—N. facialis
Pons Varolii—Pons (Varoli)
Nucleus of the olivary body[6]
Nucleus olivaris inferior
Sixth cranial or abducent ocular nerve
N. abducens
Pyramid of the medulla oblongata (anterior pyramid)[10]
Pyramis medullæ oblongatæ

(1) Brachium conjunctivum (2) Corpus restiforme

FIG. 1189.—CORONAL SECTION THROUGH THE CEREBELLUM AND THE MEDULLA OBLONGATA IN THE REGION OF THE BRACHIA CONJUNCTIVA OR SUPERIOR PEDUNCLES OF THE CEREBELLUM; THE RESPECTIVE RELATIONS OF THE MEDULLA AND THE CEREBELLUM TO THE UPPER PART OF THE FOURTH VENTRICLE. THE COURSE OF THE PEDUNCLES OF THE CEREBELLUM IN THE MEDULLARY CENTRE OR WHITE MATTER OF THE CEREBELLUM.

[1] The *tonsil* or *amygdala* of the cerebellum is by Macalister called the *tonsillitic lobe*, and by Ellis the *amygdaloid lobe.*
[2] Known also as the *corpus dentatum*, or *corpus ciliare.* [3] See Appendix, note 384.
[4] See note [1] to p. 784. [5] See Appendix, note 385. [6] See Appendix, note 385.
[7] *Eighth cranial nerve* in Soemmerring's enumeration; *portio mollis of the seventh cranial nerve* in that of Willis.
[8] *Seventh cranial nerve* in Soemmerring's enumeration; *portio dura of the seventh cranial nerve* in that of Willis.
[9] Or *linguetta laminosa* (Macalister). [10] See Appendix, note 363.

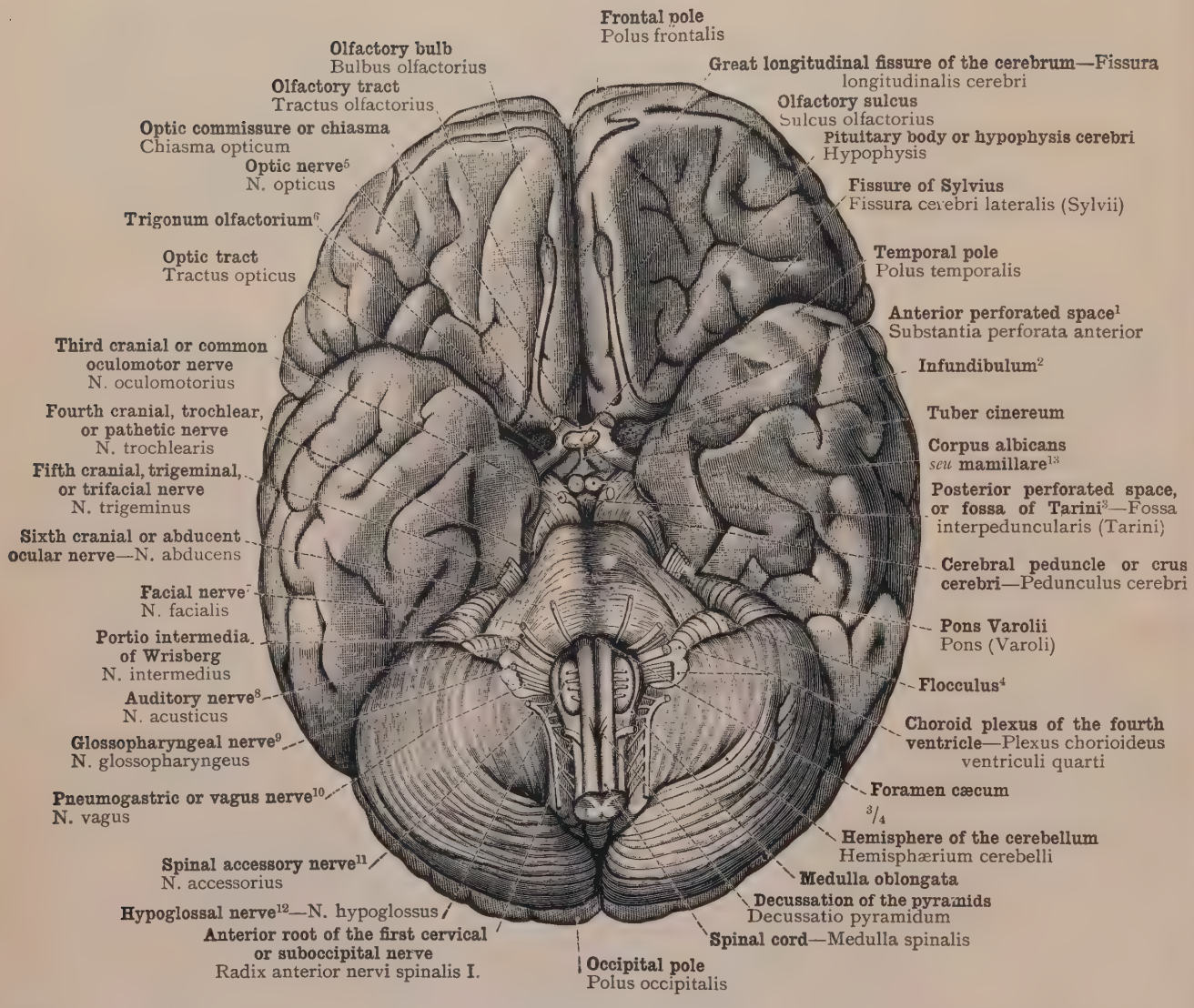


FIG. 1190.—THE INFERIOR SURFACE (BASE) OF THE BRAIN, BASIS ENCEPHALI, WITH THE EMERGING ROOTS OF THE CRANIAL NERVES, RADICES NERVORUM CEREBRALIUM. THE INFERIOR OR BASAL SURFACE OF THE CEREBRUM, FACIES BASALIS CEREBRI, IS CONCEALED BEHIND BY THE CEREBELLUM.

1 The grey matter forming the floor of the *anterior perforated space* is distinguished by the name of the *anterior perforated plate* or *lamina*.
2 See Appendix, note 361. 3 See Appendix, note 362. 4 Or *subpeduncular lobe* (Ellis).
5 Or *second cranial nerve*. 6 See Appendix, note 368.
7 *Seventh cranial nerve* in Soemmerring's enumeration; *portio dura* of the *seventh cranial nerve* in that of Willis.
8 *Eighth cranial nerve* in Soemmerring's enumeration; *portio mollis* of the *eighth cranial nerve* in that of Willis.
9 *Ninth cranial nerve* in Soemmerring's enumeration; *first trunk* of the *eighth cranial nerve* in that of Willis.
10 *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.
11 *Eleventh cranial nerve* in Soemmerring's enumeration; *third trunk* of the *eighth cranial nerve* in that of Willis.
12 *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; also known as the *lingual motor nerve*.
13 Also known as the *bulb of the fornix*.

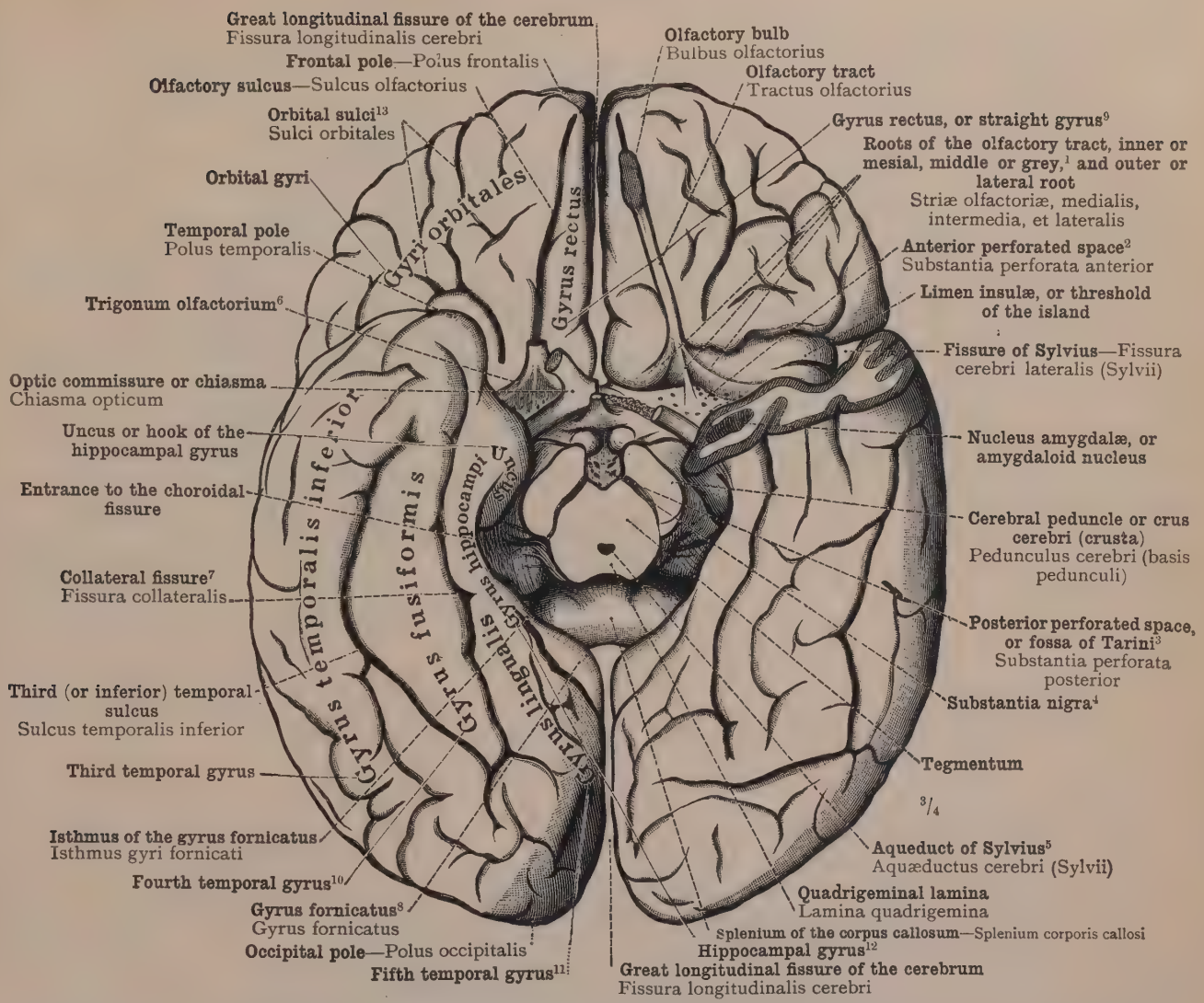


FIG. 1191.—THE INFERIOR OR BASAL SURFACE OF THE CEREBRUM, FACIES BASALIS CEREBRI; THE WHOLE EXTENT OF THIS SURFACE IS VISIBLE, THE MEDULLA OBLONGATA, PONS VAROLII, AND CEREBELLUM (*i.e.*, THE *RHOMBENCEPHALON—*see Appendix, note* [355]) HAVING BEEN REMOVED BY A TRANSVERSE SECTION THROUGH THE MID-BRAIN. CONVOLUTIONS AND FURROWS OF THE HEMISPHERES, GYRI ET SULCI CEREBRI. THE FRONTAL, TEMPORAL, AND OCCIPITAL POLES OF THE HEMISPHERES.

The anterior extremity of the left temporal lobe has been cut away, the optic commissure or chiasma has been cut through in the median plane, and its left half has been removed. The anterior perforated space has thus been fully exposed on the left side, and its relations to the threshold of the island, limen insulæ, and to the parts of the rhinencephalon situate on the mesial surface of the hemisphere, have been made manifest. The olfactory tract, tractus olfactorius, has been cut away on the right side, in order to display the olfactory sulcus.

1 See Appendix, note [368].
2 The grey matter forming the floor of the *anterior perforated space* is distinguished by the name of the *anterior perforated plate* or *lamina*.
3 The grey matter forming the floor of the *posterior perforated space* is distinguished by the name of the *posterior perforated plate* or *lamina*. See also Appendix, note [362].
4 Called by Macalister the *locus niger*. 5 Or *iter a tertio ad quartum ventriculum*. 6 See Appendix, note [368].
7 Sometimes regarded also as the *fourth temporal sulcus*. 8 See Appendix, note [390]. 9 See Appendix, note [367].
10 *Fourth Temporal Gyrus.*—The posterior part of this gyrus was formerly known in England as the *fusiform lobule;* and the gyrus as a whole is called by Toldt *gyrus fusiformis.*
11 *Fifth Temporal Gyrus.*—The author's name for this is *gyrus lingualis*, a modification of Huschke's *lingual lobule;* Wilder called it the *subcalcarine gyrus;* and it is often known as the *infracalcarine gyrus.* In front it is continued into the *hippocampal gyrus.* See note 12 below.
12 *Hippocampal Gyrus.*—This was formerly called the *subiculum cornu ammonis;* together with the *fifth temporal* or *infracalcarine gyrus* (see note 11 above), it makes up the *uncinate gyrus.* See also Appendix, note [390].
13 *Orbital Sulci.*—The principal sulci of the orbital surface of the frontal lobe very commonly communicate with one another, combining to form what is known in England as the *orbital* or *triradiate sulcus.*

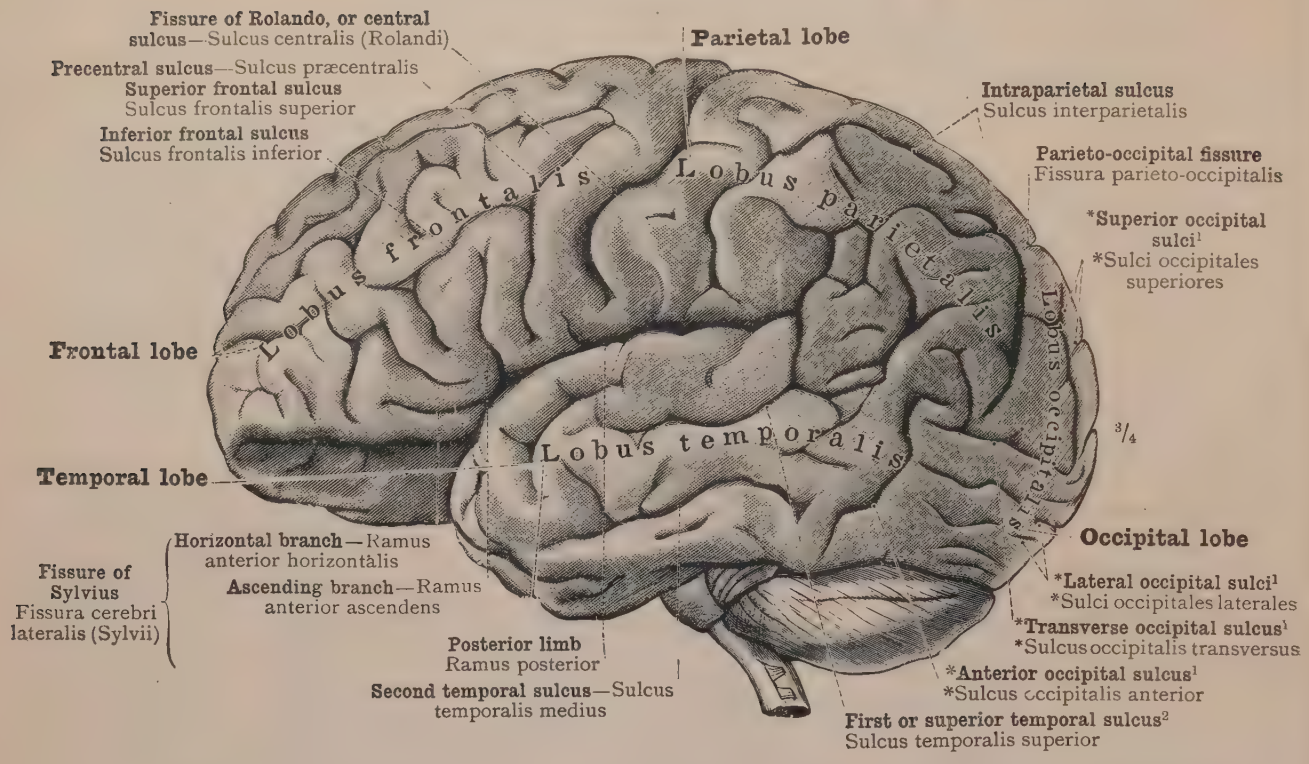


FIG. 1192.—THE CONVEX OR OUTER SURFACE, FACIES CONVEXA, OF THE LEFT CEREBRAL HEMISPHERE, SEEN FROM THE SIDE. FRONTAL, PARIETAL, TEMPORAL, AND OCCIPITAL LOBES.

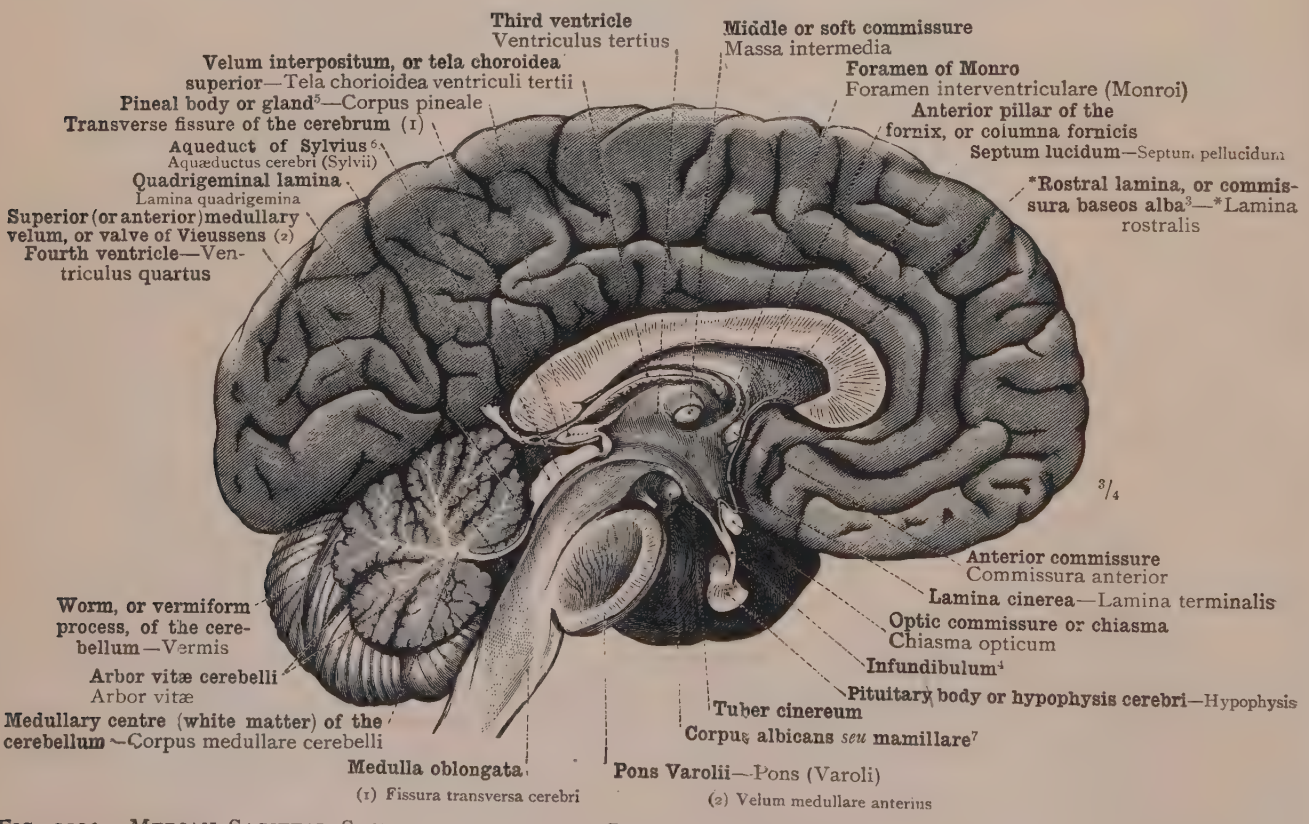


FIG. 1193.—MEDIAN SAGITTAL SECTION THROUGH THE BRAIN. THE INNER OR MESIAL SURFACE, FACIES MEDIALIS, OF THE LEFT CEREBRAL HEMISPHERE.

[1] See Appendix, note 386. [2] Also called, from its relation to the fissure of Sylvius, the *parallel fissure*. [3] See Appendix, note 387.
[4] See Appendix, note 361. [5] Also known as the *conarium* and as the *epiphysis cerebri*. See Appendix, note 365.
[6] Or *iter a tertio ad quartum ventriculum*. [7] Also known as the *bulb of the fornix*.

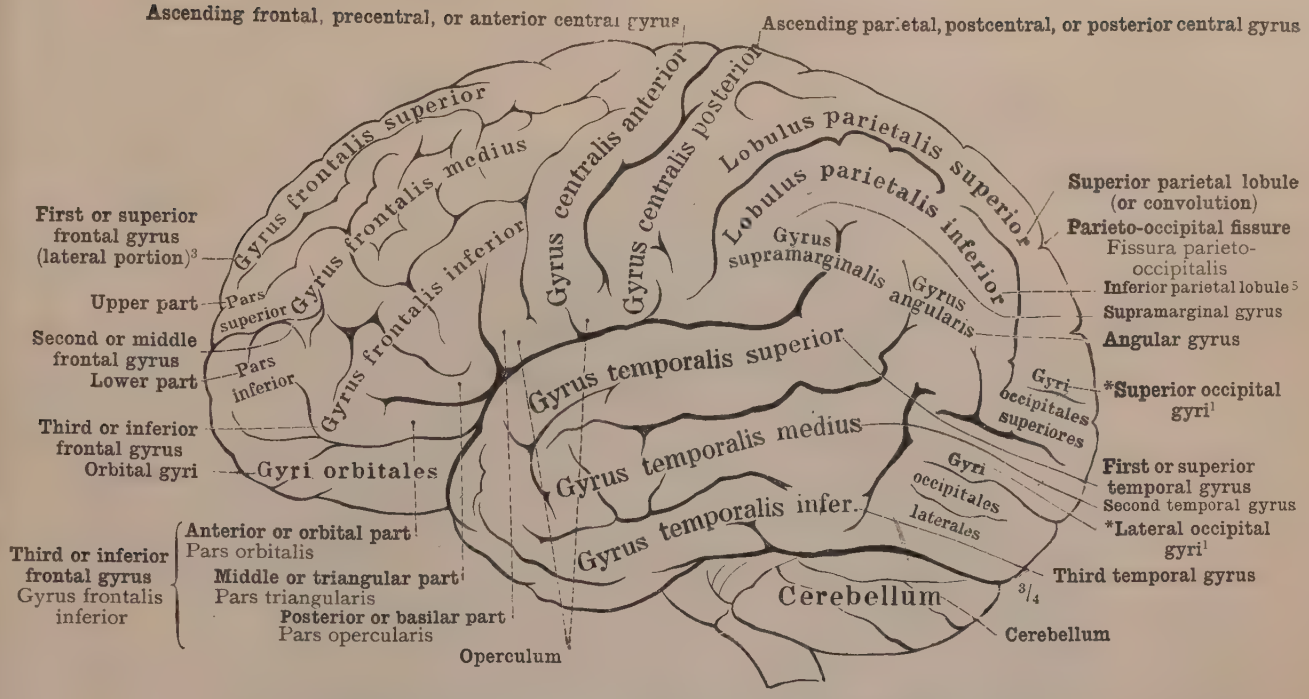
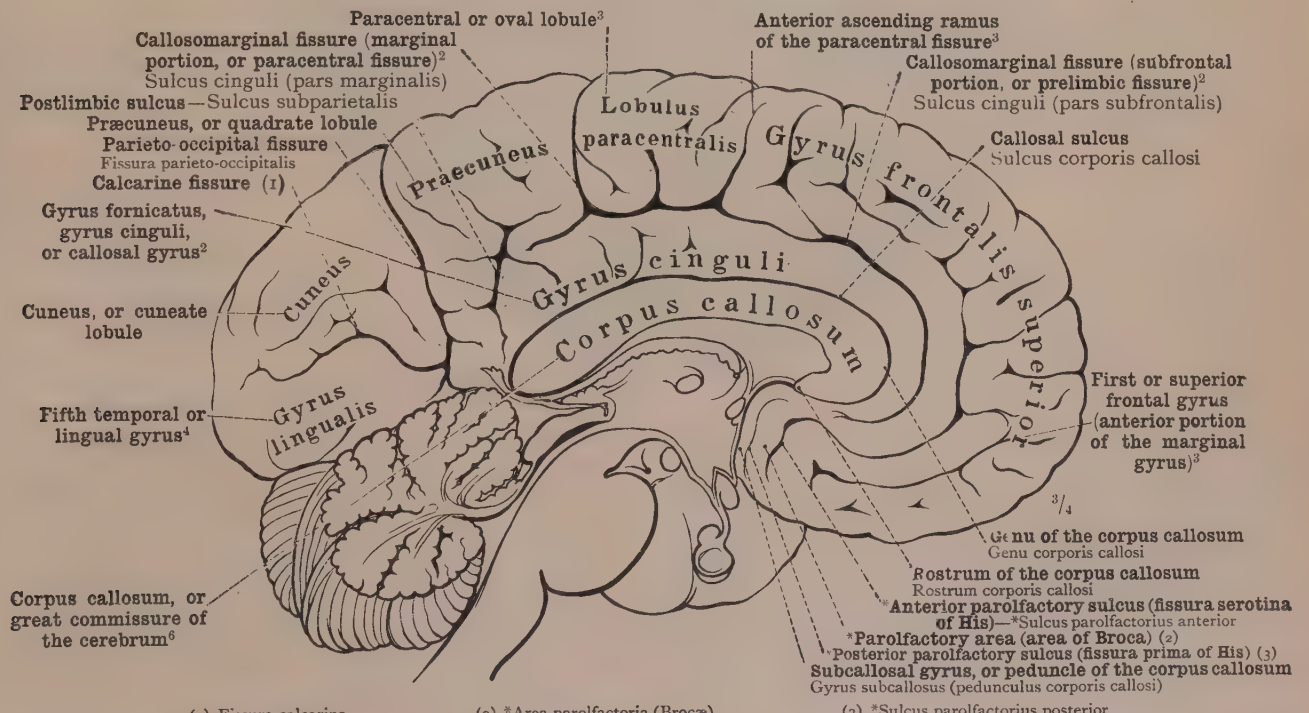


FIG. 1194.—THE LEFT HEMISPHERE, HEMISPHÆRIUM SINISTRUM, OF THE CEREBRUM; CONVEX OR OUTER SURFACE, FACIES CONVEXA, SEEN FROM THE SIDE. GYRI AND SULCI OF THE CEREBRUM.


Paracentral or oval lobule[3]
Callosomarginal fissure (marginal portion, or paracentral fissure)[2]
Sulcus cinguli (pars marginalis)
Postlimbic sulcus—Sulcus subparietalis
Præcuneus, or quadrate lobule
Parieto-occipital fissure
Fissura parieto-occipitalis
Calcarine fissure (1)
Gyrus fornicatus, gyrus cinguli, or callosal gyrus[2]
Cuneus, or cuneate lobule
Fifth temporal or lingual gyrus[4]
Corpus callosum, or great commissure of the cerebrum[6]
Anterior ascending ramus of the paracentral fissure[3]
Callosomarginal fissure (subfrontal portion, or prelimbic fissure)[2]
Sulcus cinguli (pars subfrontalis)
Callosal sulcus
Sulcus corporis callosi
Lobulus paracentralis
Gyrus frontalis superior
Gyrus cinguli
Corpus callosum
Praecuneus
Cuneus
Gyrus lingualis
First or superior frontal gyrus (anterior portion of the marginal gyrus)[3]
3/4
Genu of the corpus callosum
Genu corporis callosi
Rostrum of the corpus callosum
Rostrum corporis callosi
*Anterior parolfactory sulcus (fissura serotina of His)—*Sulcus parolfactorius anterior
*Parolfactory area (area of Broca) (2)
*Posterior parolfactory sulcus (fissura prima of His) (3)
Subcallosal gyrus, or peduncle of the corpus callosum
Gyrus subcallosus (pedunculus corporis callosi)

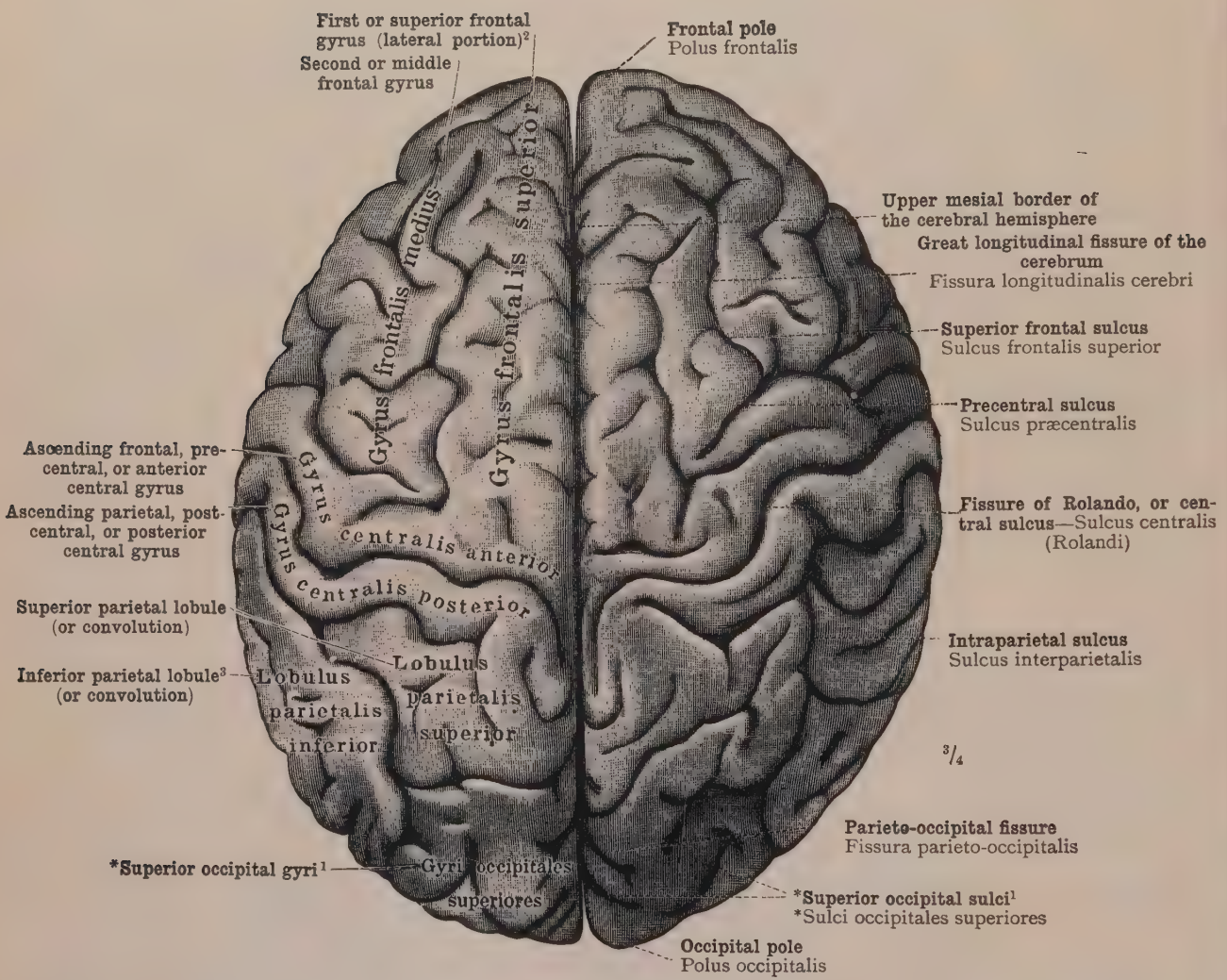
(1) Fissura calcarina (2) *Area parolfactoria (Brocæ) (3) *Sulcus parolfactorius posterior

FIG. 1195.—MEDIAN SAGITTAL SECTION THROUGH THE BRAIN. GYRI AND SULCI OF THE INNER OR MESIAL SURFACE (FACIES MEDIALIS) OF THE LEFT CEREBRAL HEMISPHERE.

[1] See Appendix, note 386. [2] See Appendix, note 390. [3] See Appendix, note 388. [4] See note [11] to p. 775.

[5] *Inferior Parietal Lobule.*—Quain divides this into three gyri, the *supramarginal*, the *angular*, and the *postparietal*. The last named, which is not mentioned by Toldt, lies between the *gyrus angularis* and the *gyri occipitales superiores* in Fig. 1194.

[6] Formerly known as the *trabs cerebri*.



[1] See Appendix, note 386. [2] See Appendix, note 388. [3] See note 5 to p. 777.

FIG. 1196.—THE HEMISPHERES OF THE CEREBRUM, HEMISPHÆRIA CEREBRI; THEIR OUTER OR CONVEX SURFACE, FACIES CONVEXA, SEEN FROM ABOVE. GYRI AND SULCI OF THE CEREBRUM. DIPPING DEEPLY BETWEEN THE TWO HEMISPHERES IS THE GREAT LONGITUDINAL FISSURE OF THE CEREBRUM; ON EITHER SIDE OF THIS FISSURE IS THE UPPER MESIAL BORDER OF THE HEMISPHERE, WHICH SEPARATES THE OUTER OR CONVEX SURFACE OF THE HEMISPHERE FROM ITS INNER OR MESIAL SURFACE, AND EXTENDS FROM THE FRONTAL TO THE OCCIPITAL POLE.

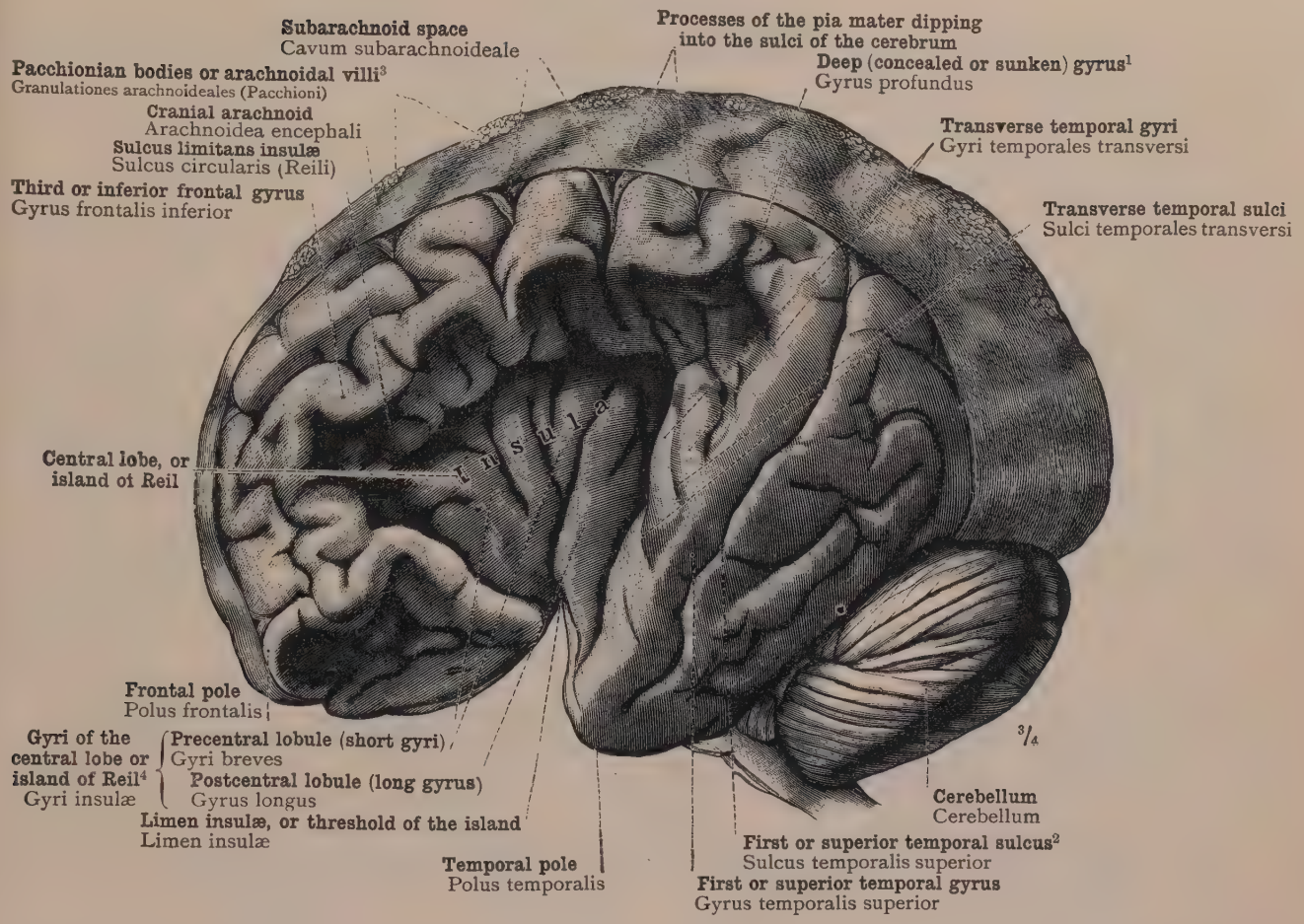


FIG. 1197.—THE OUTER OR CONVEX SURFACE, FACIES CONVEXA, OF THE LEFT CEREBRAL HEMISPHERE, SEEN FROM THE SIDE. THE TEMPORAL LOBE HAS BEEN DRAWN AWAY AS FAR AS POSSIBLE FROM THE FRONTAL AND PARIETAL LOBES, SO THAT THE SYLVIAN FISSURE IS WIDELY OPENED, AND IN THE DEPTH OF THIS FISSURE THE CENTRAL LOBE OR ISLAND OF REIL (INSULA) WITH ITS GYRI IS DISPLAYED, AND THE TRANSVERSE TEMPORAL SULCI AND GYRI ON THE UPPER SURFACE OF THE TEMPORAL LOBE ARE ALSO EXPOSED TO VIEW.

ON THE SURFACE OF THE UPPER PART OF THE HEMISPHERE THE PIA MATER AND THE ARACHNOID (PIA MATER ET ARACHNOIDEA ENCEPHALI) HAVE BEEN LEFT INTACT; BY DRAWING THE GYRI OF THIS PART OF THE BRAIN A LITTLE AWAY FROM ONE ANOTHER, THE LAMELLIFORM DUPLICATURES OF PIA MATER PASSING TO THE BOTTOM OF THE SULCI ARE DISPLAYED. THROUGH THE DURA MATER, ALONG THE LINE OF THE SUPERIOR LONGITUDINAL SINUS, THE PACCHIONIAN BODIES (GRANULATIONES ARACHNOIDEALES PACCHIONI) ARE VISIBLE.

1 *Gyri Profundi.*—This name is given by the author to convolutions that do not appear on the surface of the brain, being hidden in the depths of the sulci and fissures, and becoming visible only when these are widely opened. In England they are known most suitably as *concealed gyri.*

2 Also called, from its relation to the fissure of Sylvius, the *parallel fissure.*

3 Known also as *Pacchionian glands* or *Pacchionian granulations.*

4 The longest and deepest sulcus on the surface of the island of Reil, which separates the precentral lobule (gyri breves) from the post central lobule (gyrus longus), has been called the *sulcus centralis insulæ.* It is well marked in Fig. 1197.

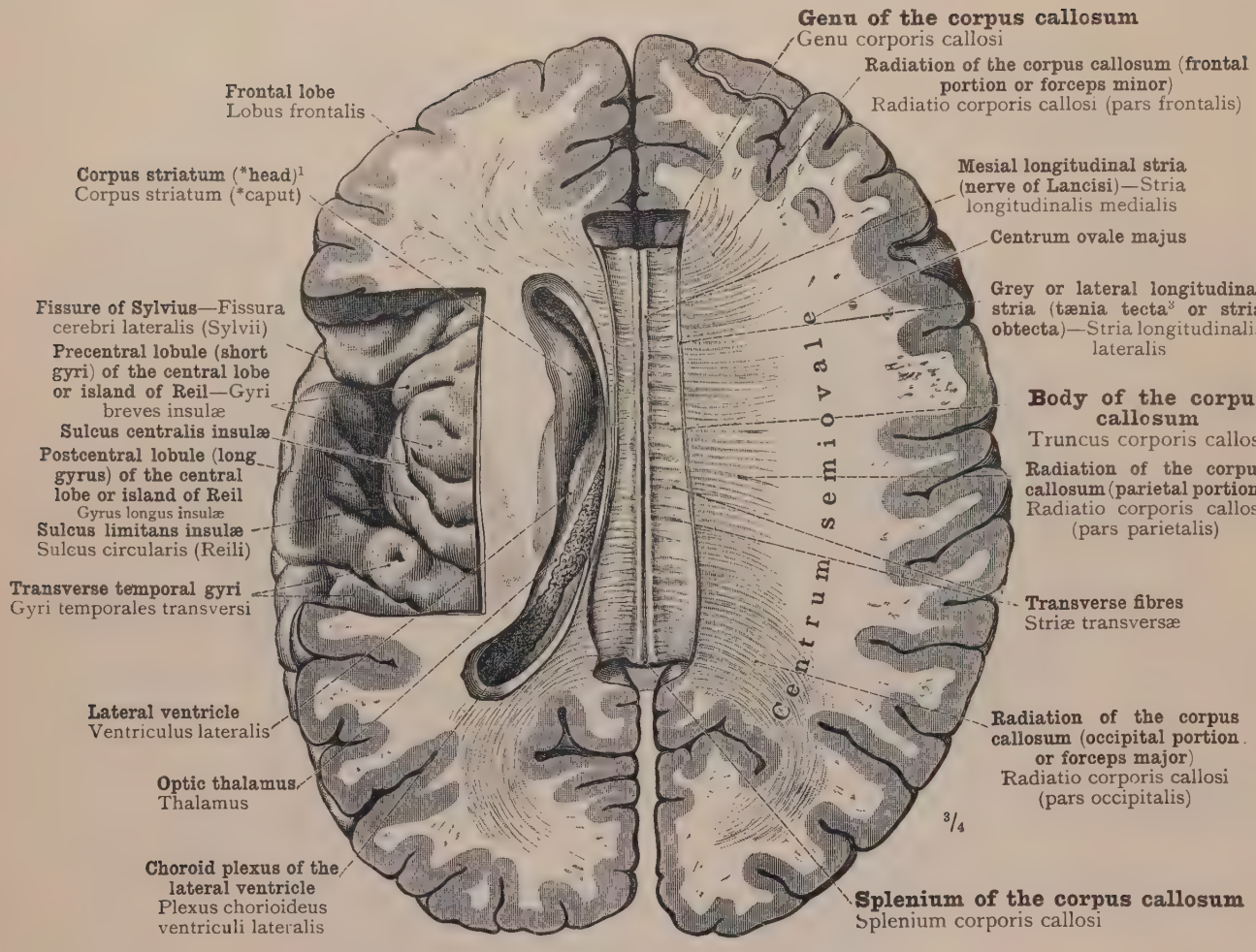

Genu of the corpus callosum
Genu corporis callosi
Radiation of the corpus callosum (frontal portion or forceps minor)
Radiatio corporis callosi (pars frontalis)
Frontal lobe
Lobus frontalis
Corpus striatum (*head)[1]
Corpus striatum (*caput)
Mesial longitudinal stria (nerve of Lancisi)—Stria longitudinalis medialis
Centrum ovale majus
Grey or lateral longitudinal stria (tænia tecta[3] or stria obtecta)—Stria longitudinalis lateralis
Fissure of Sylvius—Fissura cerebri lateralis (Sylvii)
Precentral lobule (short gyri) of the central lobe or island of Reil—Gyri breves insulæ
Sulcus centralis insulæ
Postcentral lobule (long gyrus) of the central lobe or island of Reil
Gyrus longus insulæ
Sulcus limitans insulæ
Sulcus circularis (Reili)
Body of the corpus callosum
Truncus corporis callosi
Radiation of the corpus callosum (parietal portion)
Radiatio corporis callosi (pars parietalis)
Transverse temporal gyri
Gyri temporales transversi
Transverse fibres
Striæ transversæ
Centrum semiovale
Lateral ventricle
Ventriculus lateralis
Radiation of the corpus callosum (occipital portion or forceps major)
Radiatio corporis callosi (pars occipitalis)
Optic thalamus
Thalamus
3/4
Choroid plexus of the lateral ventricle
Plexus chorioideus ventriculi lateralis
Splenium of the corpus callosum
Splenium corporis callosi

FIG. 1198.—THE UPPER PART OF BOTH CEREBRAL HEMISPHERES HAS BEEN REMOVED BY A SECTION IN THE PLANE OF THE DORSAL SURFACE OF THE CORPUS CALLOSUM OR GREAT COMMISSURE OF THE CEREBRUM (TRABS CEREBRI), SO THAT THE DORSUM OF THAT BODY IS FULLY EXPOSED, AND THE MEDULLARY CENTRE OR WHITE MATTER (MEDITULLIUM) OF THE CEREBRAL HEMISPHERES IS SEEN IN SECTION AS THE CENTRUM OVALE MAJUS (CENTRUM SEMIOVALE)[2].

IN THE RIGHT HEMISPHERE, THE SEVERAL PORTIONS OF THE RADIATION OF THE FIBRES OF THE CORPUS CALLOSUM (RADIATIO CORPORIS CALLOSI) ARE INDICATED. IN THE LEFT HEMISPHERE, SEGMENTS HAVE BEEN REMOVED IN SUCH A MANNER AS ON THE ONE HAND TO EXPOSE FROM ABOVE THE CENTRAL LOBE OR ISLAND OF REIL (INSULA), AND ON THE OTHER TO OPEN THE LATERAL VENTRICLE, AND THUS TO DISPLAY THE *HEAD OF THE CORPUS STRIATUM (*i.e.*, THE HEAD OF THE CAUDATE OR INTRAVENTRICULAR NUCLEUS OF THE CORPUS STRIATUM—*see note* [1] *to p.* 766) WITH THE NEIGHBOURING PART OF THE OPTIC THALAMUS. THE MUTUAL RELATIONS OF THESE PARTS OF THE CEREBRUM ARE THUS MADE MANIFEST.

[1] See note [1] to p. 766.

[2] *Centrum Semiovale.*—The central white matter seen in a horizontal section of one cerebral hemisphere at the level of the horizontal part of the callosomarginal fissure is known as the *centrum ovale minus*. If the upper part of *both* hemispheres be removed by a horizontal section in the plane of the dorsal surface of the corpus callosum, the white centres of the two hemispheres united by the upper surface of the corpus callosum make up the *centrum ovale majus*. The author is therefore strictly accurate in speaking of the white matter of a single hemisphere displayed by a section at this level as the *centrum semiovale*, but the latter term is not often used in England.

[3] See Appendix, note 392.

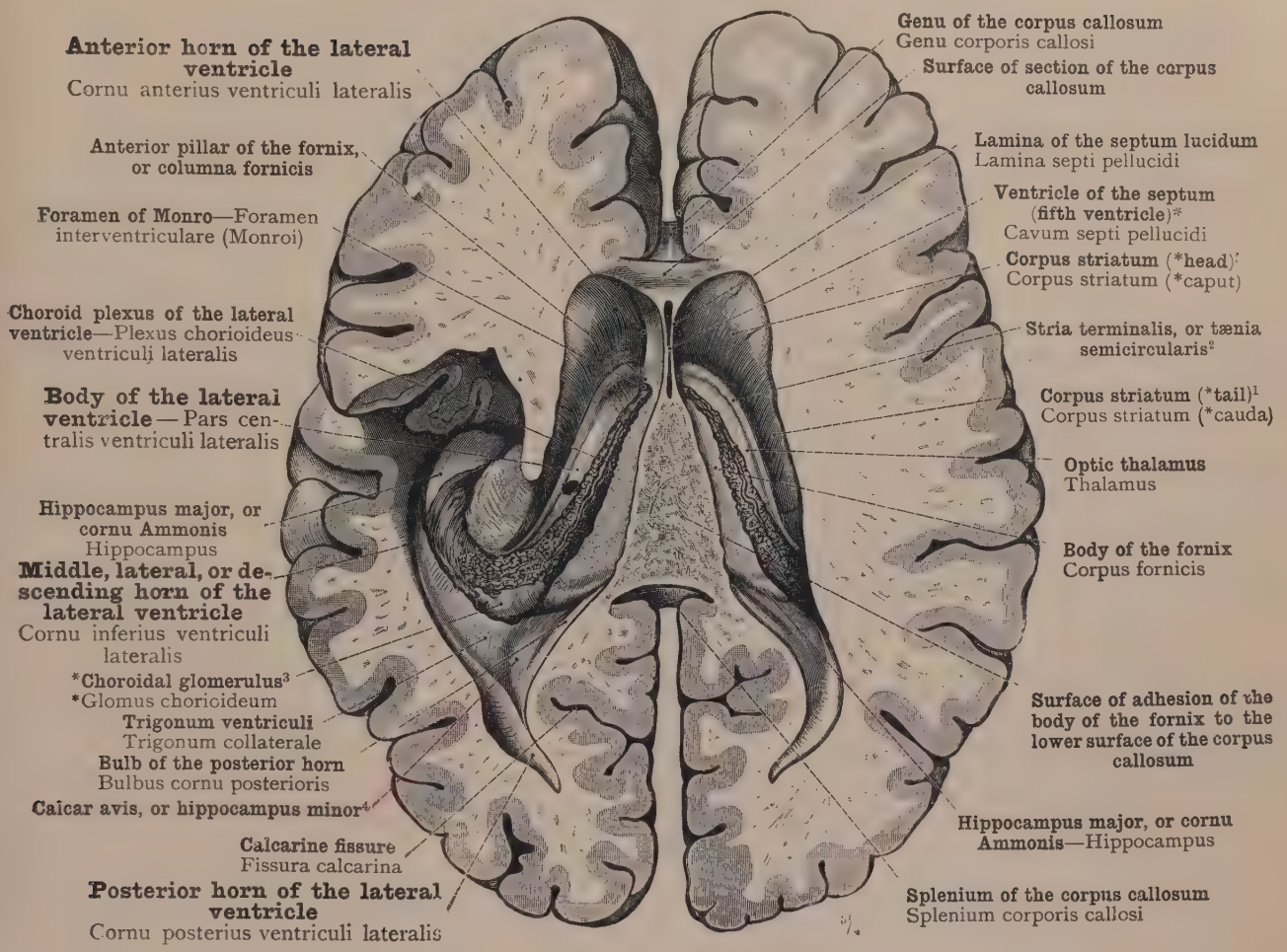
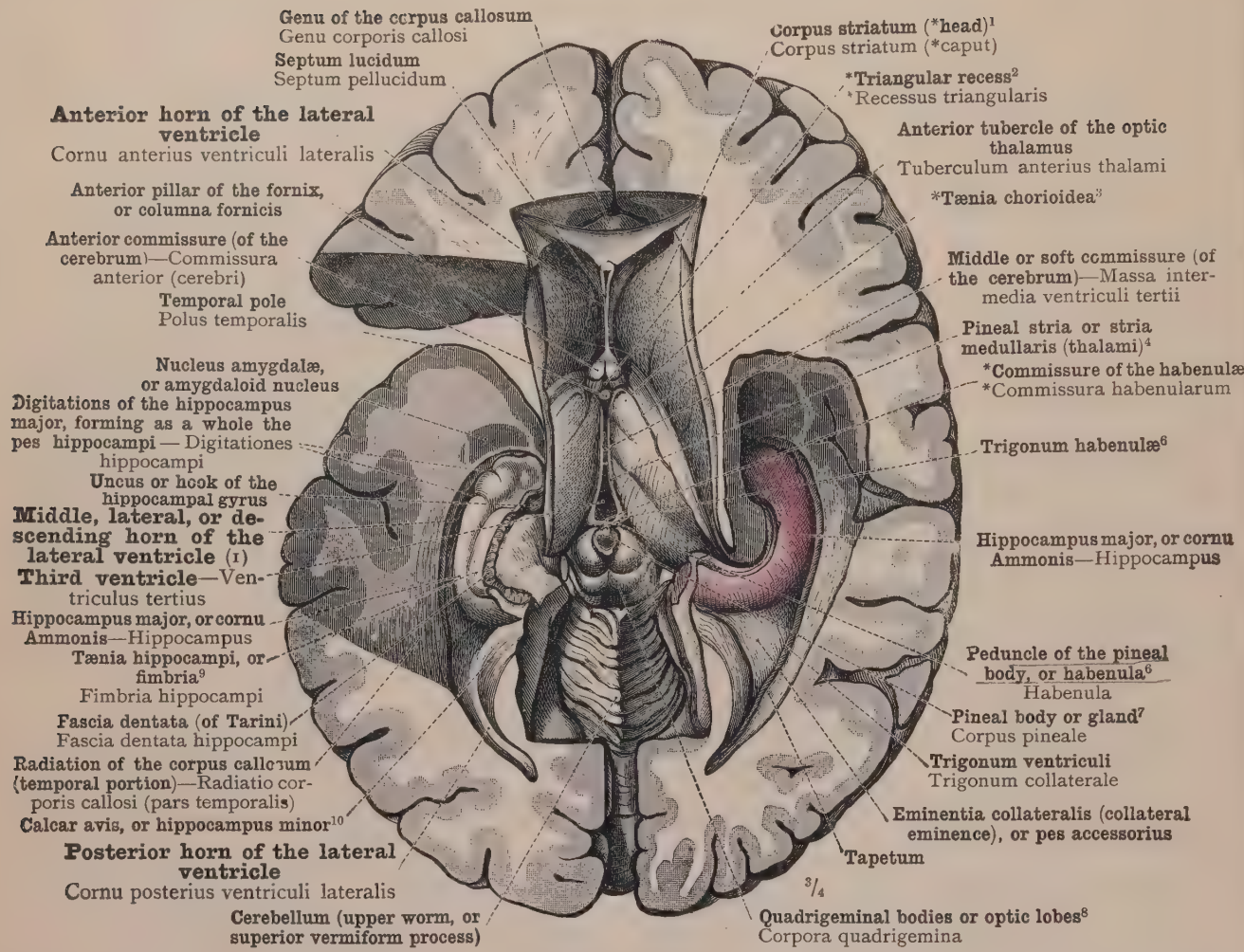

Anterior horn of the lateral ventricle
Cornu anterius ventriculi lateralis
Anterior pillar of the fornix, or columna fornicis
Foramen of Monro—Foramen interventriculare (Monroi)
Choroid plexus of the lateral ventricle—Plexus chorioideus ventriculi lateralis
Body of the lateral ventricle—Pars centralis ventriculi lateralis
Hippocampus major, or cornu Ammonis
Hippocampus
Middle, lateral, or descending horn of the lateral ventricle
Cornu inferius ventriculi lateralis
*Choroidal glomerulus[3]
*Glomus choricideum
Trigonum ventriculi
Trigonum collaterale
Bulb of the posterior horn
Bulbus cornu posterioris
Calcar avis, or hippocampus minor[4]
Calcarine fissure
Fissura calcarina
Posterior horn of the lateral ventricle
Cornu posterius ventriculi lateralis
Genu of the corpus callosum
Genu corporis callosi
Surface of section of the corpus callosum
Lamina of the septum lucidum
Lamina septi pellucidi
Ventricle of the septum (fifth ventricle)*
Cavum septi pellucidi
Corpus striatum (*head)
Corpus striatum (*caput)
Stria terminalis, or tænia semicircularis[2]
Corpus striatum (*tail)[1]
Corpus striatum (*cauda)
Optic thalamus
Thalamus
Body of the fornix
Corpus fornicis
Surface of adhesion of the body of the fornix to the lower surface of the corpus callosum
Hippocampus major, or cornu Ammonis—Hippocampus
Splenium of the corpus callosum
Splenium corporis callosi

FIG. 1199.—THE UPPER PORTION OF THE CEREBRAL HEMISPHERES AND OF THE CORPUS CALLOSUM OR GREAT COMMISSURE OF THE CEREBRUM (TRABS CEREBRI) HAVING BEEN REMOVED, THE UPPER OR DORSAL SURFACE OF THE FORNIX WAS EXPOSED AND BOTH LATERAL VENTRICLES (VENTRICULI LATERALES) WERE OPENED. IN THE RIGHT HEMISPHERE, THE ANTERIOR HORN (CORNU ANTERIUS), POSTERIOR HORN (CORNU POSTERIUS), AND THE BODY (PARS CENTRALIS), ONLY, OF THE VENTRICLE ARE DISPLAYED; WHEREAS IN THE LEFT HEMISPHERE, BY THE REMOVAL OF A FURTHER PORTION OF THE BRAIN SUBSTANCE, THE MIDDLE, LATERAL, OR DESCENDING HORN (CORNU INFERIUS), DESCENDING INTO THE TEMPORAL LOBE, HAS ALSO BEEN OPENED. THE SEPTUM BETWEEN THE TWO ANTERIOR HORNS, KNOWN AS THE SEPTUM LUCIDUM (SEPTUM PELLUCIDUM), IS SEEN IN HORIZONTAL SECTION; ITS RIGHT AND LEFT LATERAL LAMINÆ (LAMINÆ SEPTI PELLUCIDI) ARE SEPARATED ONE FROM ANOTHER BY A MEDIAN CAVITY KNOWN AS THE VENTRICLE OF THE SEPTUM OR FIFTH VENTRICLE (CAVUM SEPTI PELLUCIDI).

[1] See note [1] to p. 766. [2] See Appendix, note 392.

[3] *Choroidal Glomerulus.*—"The thickened margin of the velum interpositum projects freely on either side into the body of the lateral ventricle, forming the choroid plexus of that cavity, which extends along the posterior pillar of the fornix (crus fornicis) into the descending horn of the lateral ventricle; just before it enters the descending horn, the choroid plexus exhibits a considerable enlargement, the *glomus chorioideum*" (Von Langer and Toldt, *op. cit.*, p. 605). This structure is described neither by Quain nor by Macalister.

[4] Or *ergot* (Morand).


Genu of the corpus callosum
Genu corporis callosi
Septum lucidum
Septum pellucidum
Anterior horn of the lateral ventricle
Cornu anterius ventriculi lateralis
Anterior pillar of the fornix, or columna fornicis
Anterior commissure (of the cerebrum)—Commissura anterior (cerebri)
Temporal pole
Polus temporalis
Nucleus amygdalæ, or amygdaloid nucleus
Digitations of the hippocampus major, forming as a whole the pes hippocampi—Digitationes hippocampi
Uncus or hook of the hippocampal gyrus
Middle, lateral, or descending horn of the lateral ventricle (1)
Third ventricle—Ventriculus tertius
Hippocampus major, or cornu Ammonis—Hippocampus
Tænia hippocampi, or fimbria[9]
Fimbria hippocampi
Fascia dentata (of Tarini)
Fascia dentata hippocampi
Radiation of the corpus callosum (temporal portion)—Radiatio corporis callosi (pars temporalis)
Calcar avis, or hippocampus minor[10]
Posterior horn of the lateral ventricle
Cornu posterius ventriculi lateralis
Cerebellum (upper worm, or superior vermiform process)
Corpus striatum (*head)[1]
Corpus striatum (*caput)
*Triangular recess[2]
*Recessus triangularis
Anterior tubercle of the optic thalamus
Tuberculum anterius thalami
*Tænia chorioidea[3]
Middle or soft commissure (of the cerebrum)—Massa intermedia ventriculi tertii
Pineal stria or stria medullaris (thalami)[4]
*Commissure of the habenulæ
*Commissura habenularum
Trigonum habenulæ[6]
Hippocampus major, or cornu Ammonis—Hippocampus
Peduncle of the pineal body, or habenula[6]
Habenula
Pineal body or gland[7]
Corpus pineale
Trigonum ventriculi
Trigonum collaterale
Eminentia collateralis (collateral eminence), or pes accessorius
Tapetum
3/4
Quadrigeminal bodies or optic lobes[8]
Corpora quadrigemina

(1) Cornu inferius ventriculi lateralis.

FIG. 1200.—THE UPPER PART OF THE CEREBRAL HEMISPHERES, THE CORPUS CALLOSUM OR GREAT COMMISSURE (TRABS CEREBRI), THE FORNIX, AND THE VELUM INTERPOSITUM HAVING BEEN REMOVED, THE LATERAL VENTRICLES AND THE THIRD VENTRICLE WERE FULLY OPENED FROM ABOVE; AND THE QUADRIGEMINAL BODIES OR OPTIC LOBES (CORPORA QUADRIGEMINA—*see note* [5] *to p.* 760), THE PINEAL BODY OR GLAND (CORPUS PINEALE—*see note* [7] *below*), AND ALSO THE UPPER WORM OR SUPERIOR VERMIFORM PROCESS (VERMIS SUPERIOR) OF THE CEREBELLUM, WERE EXPOSED TO VIEW.

FORMING THE OUTER WALL OF THE ANTERIOR HORN OF THE LATERAL VENTRICLE IS THE HEAD OF THE CAUDATE NUCLEUS (*CAPUT CORPORIS STRIATI—*see note* [1] *to p.* 766); FORMING THE ANTERIOR WALL OF THE SAME IS THE GENU OF THE CORPUS CALLOSUM (GENU CORPORIS CALLOSI); AND FORMING THE INNER WALL OF THE SAME IS THE SEPTUM LUCIDUM (SEPTUM PELLUCIDUM), WHICH STRETCHES FORWARD FROM THE ANTERIOR PILLAR OF THE FORNIX (COLUMNA FORNICIS) TO THE GENU OF THE CORPUS CALLOSUM. IN THE FLOOR OF THE BODY (PARS CENTRALIS) OF THE LATERAL VENTRICLE IS SEEN THE UPPER OR DORSAL SURFACE OF THE OPTIC THALAMUS, THE STRIA TERMINALIS OR TÆNIA SEMICIRCULARIS (*see Appendix, note* [392]), AND THE TAIL OF THE CAUDATE NUCLEUS (*CAUDA CORPORIS STRIATI—*see note* [1] *to p.* 766). IN THE INNER WALL OF THE POSTERIOR HORN IS THE CALCAR AVIS OR HIPPOCAMPUS MINOR; WHILST IN THE LOWER WALL OF THE MIDDLE, LATERAL, OR DESCENDING HORN PROJECTS THE CONVEXITY OF THE HIPPOCAMPUS MAJOR, OR CORNU AMMONIS. IN THE LEFT HEMISPHERE, THE POSTERIOR PORTION OF THE FRONTAL LOBE HAS BEEN COMPLETELY REMOVED BY A FRONTAL SECTION; AND, MOREOVER, BY A SECTION IN THE DIRECTION OF THE LONG AXIS OF THE TEMPORAL LOBE, THE UPPER PORTION OF THIS LOBE HAS BEEN CUT AWAY, SO THAT THE NUCLEUS AMYGDALÆ OR AMYGDALOID NUCLEUS, SITUATE NEAR THE ANTERIOR EXTREMITY OF THE TEMPORAL LOBE, IS SEEN IN SECTION.

[1] See note [1] to p. 766. [2] See Appendix, note [389].
[3] This name is given by the author to the line of attachment of the outer layer of the choroid plexus of the lateral ventricle, adjacent to the *stria terminalis* or *tænia semicircularis*. See Appendix, note [392].
[4] Also called *tænia fornicis*. See Appendix, notes [359] and [392].
[5] *Middle* of the *upper* or *dorsal* portion of the *pedunculus conarii* or *habenula* (Quain), or *transverse frænulum of the pineal body* (Macalister). See Appendix, note [365]. [6] See Appendix, note [365].
[7] Known also as the *conarium*, and as the *epiphysis cerebri*. See Appendix, note [365]. [8] See note [5] to p. 760.
[9] Called by Macalister *corpus fimbriatum*. See Appendix, note [392]. [10] Or *ergot* (Morand).

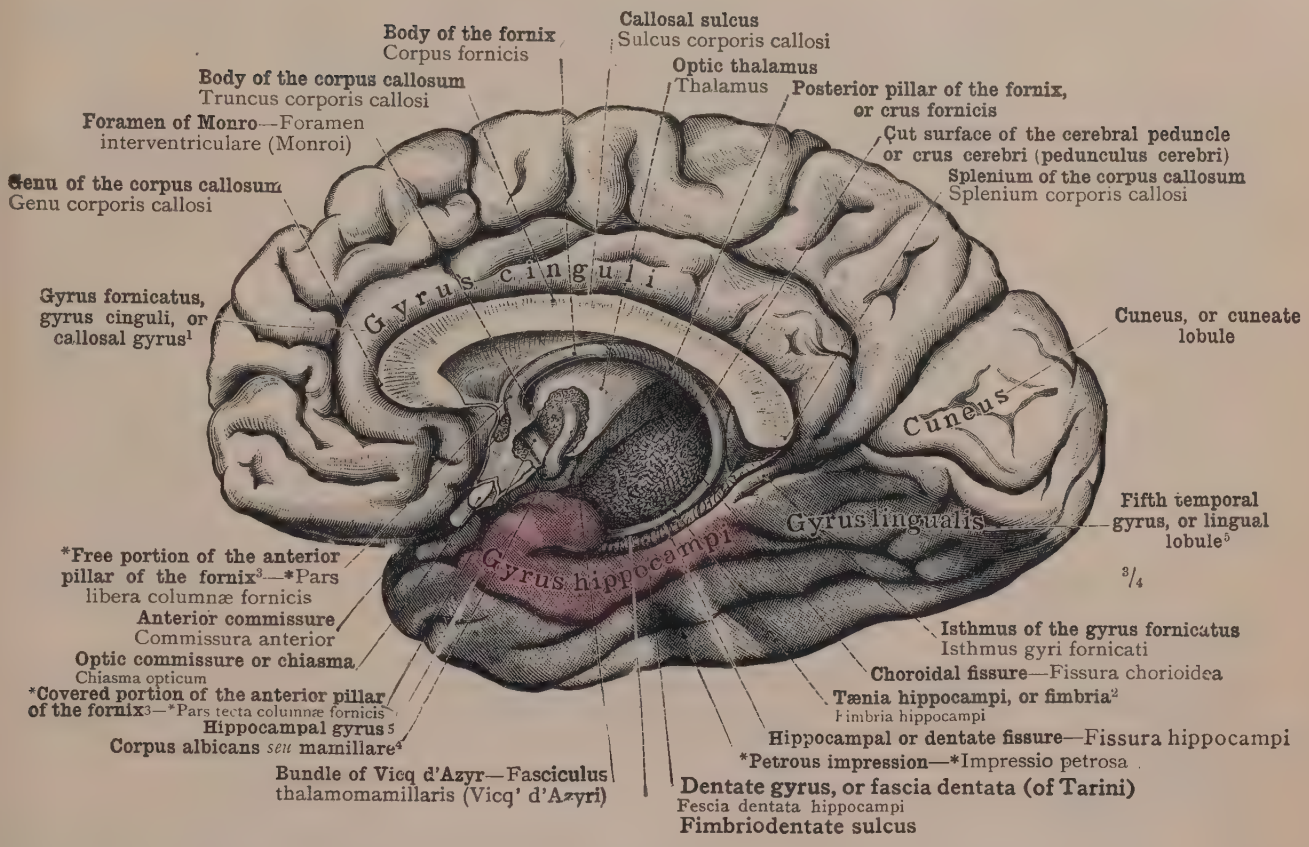

Body of the fornix
Corpus fornicis
Callosal sulcus
Sulcus corporis callosi
Optic thalamus
Thalamus
Posterior pillar of the fornix, or crus fornicis
Body of the corpus callosum
Truncus corporis callosi
Foramen of Monro—Foramen interventriculare (Monroi)
Cut surface of the cerebral peduncle or crus cerebri (pedunculus cerebri)
Splenium of the corpus callosum
Splenium corporis callosi
Genu of the corpus callosum
Genu corporis callosi
Gyrus cinguli
Gyrus fornicatus, gyrus cinguli, or callosal gyrus[1]
Cuneus, or cuneate lobule
Cuneus
Fifth temporal gyrus, or lingual lobule[5]
Gyrus lingualis
3/4
*Free portion of the anterior pillar of the fornix[3]—*Pars libera columnæ fornicis
Gyrus hippocampi
Anterior commissure
Commissura anterior
Optic commissure or chiasma
Chiasma opticum
Isthmus of the gyrus fornicatus
Isthmus gyri fornicati
Choroidal fissure—Fissura chorioidea
*Covered portion of the anterior pillar of the fornix[3]—*Pars tecta columnæ fornicis
Tænia hippocampi, or fimbria[2]
Fimbria hippocampi
Hippocampal gyrus[5]
Hippocampal or dentate fissure—Fissura hippocampi
Corpus albicans seu mamillare[4]
*Petrous impression—*Impressio petrosa
Bundle of Vicq d'Azyr—Fasciculus thalamomamillaris (Vicq' d'Azyri)
Dentate gyrus, or fascia dentata (of Tarini)
Fescia dentata hippocampi
Fimbriodentate sulcus

FIG. 1201.—THE INNER OR MESIAL SURFACE, FACIES MEDIALIS, OF THE RIGHT CEREBRAL HEMISPHERE. THE CEREBRAL PEDUNCLE OR CRUS CEREBRI HAS BEEN DIVIDED TRANSVERSELY AS IT ENTERS THE HEMISPHERE. THE *GYRUS FORNICATUS (GRAND LOBE LIMBIQUE OF BROCA—*see Appendix, note* [390]), CONSISTING OF THE GYRUS CINGULI OR CALLOSAL GYRUS (USUALLY ITSELF CALLED GYRUS FORNICATUS IN ENGLAND) AND THE GYRUS HIPPOCAMPI OR HIPPOCAMPAL GYRUS, THE TWO BEING CONNECTED BENEATH THE SPLENIUM OF THE CORPUS CALLOSUM BY THE ISTHMUS OF THE GYRUS FORNICATUS. THE GYRUS CINGULI OR CALLOSAL GYRUS SURROUNDS THE THREE PARTS OF THE CORPUS CALLOSUM OR GREAT COMMISSURE (TRABS CEREBRI) WHICH IS SEEN IN MEDIAN SAGITTAL SECTION: THESE THREE PARTS ARE THE GENU, THE BODY (TRUNCUS), AND THE SPLENIUM. THE FORNIX IS SEEN IN ITS WHOLE LENGTH, THE LOWEST, *COVERED PORTION OF THE ANTERIOR PILLAR (*PARS TECTA COLUMNÆ FORNICIS—*see Appendix, note* [391]) HAVING BEEN EXPOSED BY THE PARTIAL REMOVAL OF THE LATERAL WALL OF THE THIRD VENTRICLE. BENEATH THE SPLENIUM OF THE CORPUS CALLOSUM, THE CONTINUITY OF THE POSTERIOR PILLAR OF THE FORNIX (CRUS FORNICIS) WITH THE TÆNIA HIPPOCAMPI OR FIMBRIA (FIMBRIA HIPPOCAMPI—*see note* [2] *below*) IS MANIFEST. PARALLEL WITH THE FIMBRIA, BENEATH IT, AND SEPARATED FROM IT BY A SHALLOW GROOVE, THE FIMBRIODENTATE SULCUS, RUNS THE DENTATE GYRUS OR FASCIA DENTATA OF TARINI. BEHIND THE *COVERED PORTION OF THE ANTERIOR PILLAR OF THE FORNIX THE BUNDLE OF VICQ D'AZYR, WHICH CONNECTS THE CORPUS ALBICANS SEU MAMILLARE (OR BULB OF THE FORNIX) WITH THE OPTIC THALAMUS, HAS ALSO BEEN EXPOSED.

1 See Appendix, note 390.
2 Called by Macalister *corpus fimbriatum*. See Appendix, note 392.
3 See Appendix, note 391.
4 Also known as the *bulb of the fornix*.
5 The *fifth temporal gyrus* or *lingual lobule* and the *hippocampal gyrus* together make up the *uncinate gyrus*. The former is also known as the *subcalcarine* or *infracalcarine gyrus*, and the latter as the *subiculum cornu Ammonis*. See also Appendix, note 390.

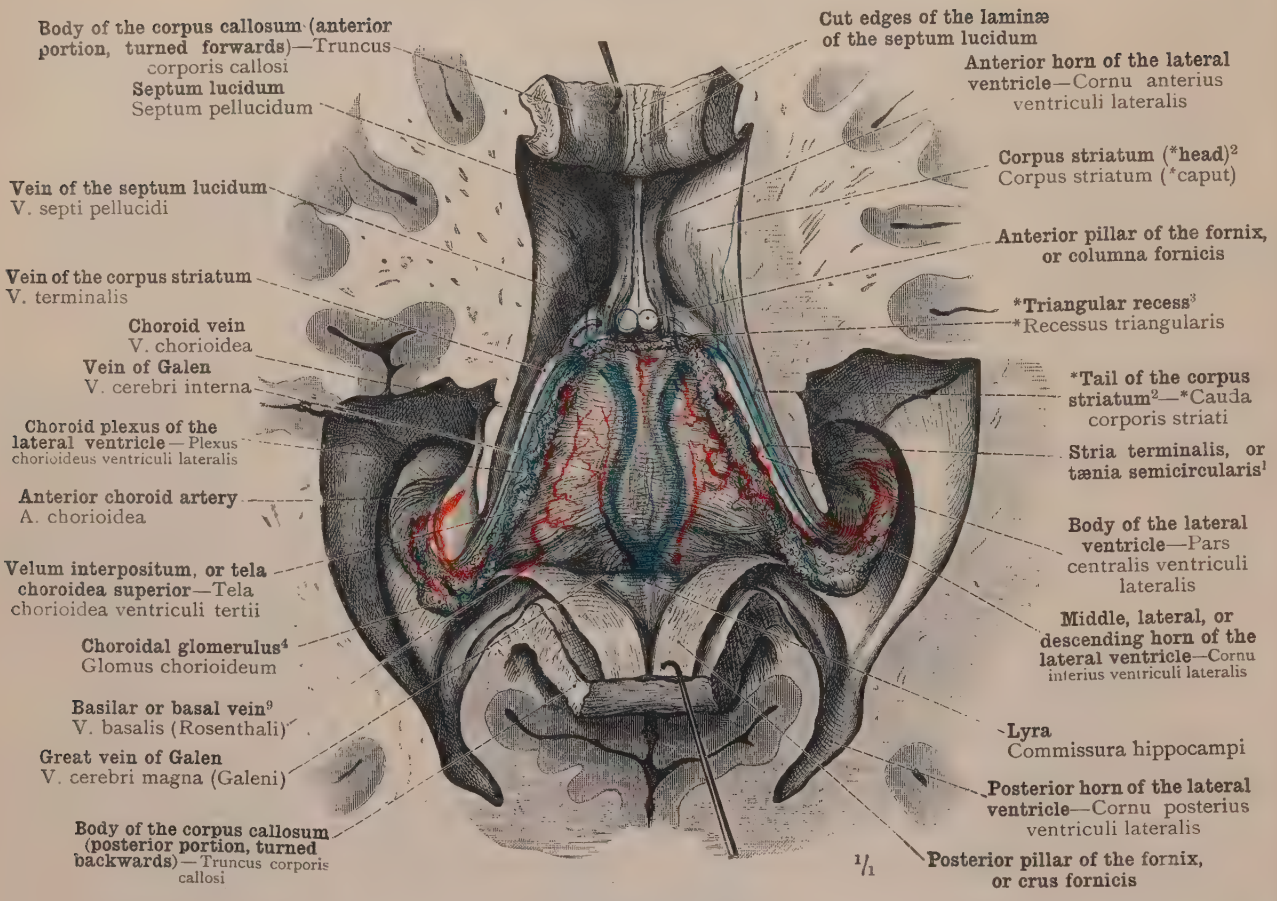

Body of the corpus callosum (anterior portion, turned forwards)—Truncus corporis callosi
Septum lucidum
Septum pellucidum
Vein of the septum lucidum
V. septi pellucidi
Vein of the corpus striatum
V. terminalis
Choroid vein
V. chorioidea
Vein of Galen
V. cerebri interna
Choroid plexus of the lateral ventricle—Plexus chorioideus ventriculi lateralis
Anterior choroid artery
A. chorioidea
Velum interpositum, or tela choroidea superior—Tela chorioidea ventriculi tertii
Choroidal glomerulus[4]
Glomus chorioideum
Basilar or basal vein[9]
V. basalis (Rosenthali)
Great vein of Galen
V. cerebri magna (Galeni)
Body of the corpus callosum (posterior portion, turned backwards)—Truncus corporis callosi
Cut edges of the laminæ of the septum lucidum
Anterior horn of the lateral ventricle—Cornu anterius ventriculi lateralis
Corpus striatum (*head)[2]
Corpus striatum (*caput)
Anterior pillar of the fornix, or columna fornicis
*Triangular recess[3]
*Recessus triangularis
*Tail of the corpus striatum[2]—*Cauda corporis striati
Stria terminalis, or tænia semicircularis[1]
Body of the lateral ventricle—Pars centralis ventriculi lateralis
Middle, lateral, or descending horn of the lateral ventricle—Cornu inferius ventriculi lateralis
Lyra
Commissura hippocampi
Posterior horn of the lateral ventricle—Cornu posterius ventriculi lateralis
Posterior pillar of the fornix, or crus fornicis
1/1

FIG. 1202.—THE VELUM INTERPOSITUM OR TELA CHOROIDEA SUPERIOR (TELA CHORIOIDEA VENTRICULI TERTII), WITH THE CHOROID PLEXUSES OF THE LATERAL VENTRICLES (PLEXUS CHOROIDEI VENTRICULORUM LATERALIUM), LAID BARE FROM ABOVE. THE LARGER BLOODVESSELS OF THE VELUM INTERPOSITUM AND THE CHOROID PLEXUSES HAVE BEEN RENDERED MORE CONSPICUOUS BY INJECTION.

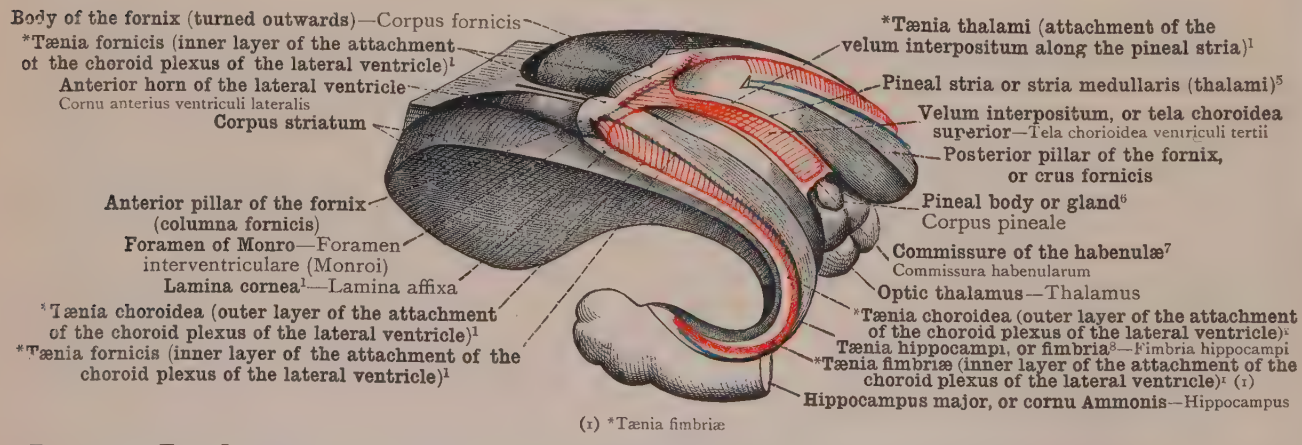

Body of the fornix (turned outwards)—Corpus fornicis
*Tænia fornicis (inner layer of the attachment of the choroid plexus of the lateral ventricle)[1]
Anterior horn of the lateral ventricle
Cornu anterius ventriculi lateralis
Corpus striatum
Anterior pillar of the fornix (columna fornicis)
Foramen of Monro—Foramen interventriculare (Monroi)
Lamina cornea[1]—Lamina affixa
*Tænia choroidea (outer layer of the attachment of the choroid plexus of the lateral ventricle)[1]
*Tænia fornicis (inner layer of the attachment of the choroid plexus of the lateral ventricle)[1]
*Tænia thalami (attachment of the velum interpositum along the pineal stria)[1]
Pineal stria or stria medullaris (thalami)[5]
Velum interpositum, or tela choroidea superior—Tela chorioidea ventriculi tertii
Posterior pillar of the fornix, or crus fornicis
Pineal body or gland[6]
Corpus pineale
Commissure of the habenulæ[7]
Commissura habenularum
Optic thalamus—Thalamus
*Tænia choroidea (outer layer of the attachment of the choroid plexus of the lateral ventricle)[1]
Tænia hippocampi, or fimbria[8]—Fimbria hippocampi
*Tænia fimbriæ (inner layer of the attachment of the choroid plexus of the lateral ventricle)[1] (1)
Hippocampus major, or cornu Ammonis—Hippocampus
(1) *Tænia fimbriæ

FIG. 1203.—THE LINES OF ATTACHMENT OF THE VELUM INTERPOSITUM AND THE CHOROID PLEXUSES OF THE LATERAL VENTRICLES (TÆNIA TELARUM[1]) IN THE PROSENCEPHALON AND THALAMENCEPHALON. DIAGRAMMATIC. THE RIGHT POSTERIOR PILLAR OF THE FORNIX HAS BEEN CUT THROUGH WITH THE VELUM INTERPOSITUM, AND ITS ANTERIOR PORTION HAS BEEN TURNED OUTWARDS. ON THE LEFT SIDE, ALSO, THE ANTERIOR PORTION OF THE FORNIX HAS BEEN DRAWN A LITTLE UPWARDS. SEEN OBLIQUELY FROM ABOVE AND THE LEFT SIDE.

[1] See Appendix, note 392. [2] See note [1] to p. 766. [3] See Appendix, note 389. [4] See note 3 to p. 781.
[5] Often known in England as the *tænia fornicis*. See Appendix, notes 359, 365, and 392.
[6] Known also as the *conarium* and as the *epiphysis cerebri*. See Appendix, note 365.
[7] Called by Macalister the *transverse frænulum of the pineal body*. See Appendix, note 365.
[8] Called by Macalister the *corpus fimbriatum*. See also Appendix, note 392. [9] See Appendix to Part V., note 297.

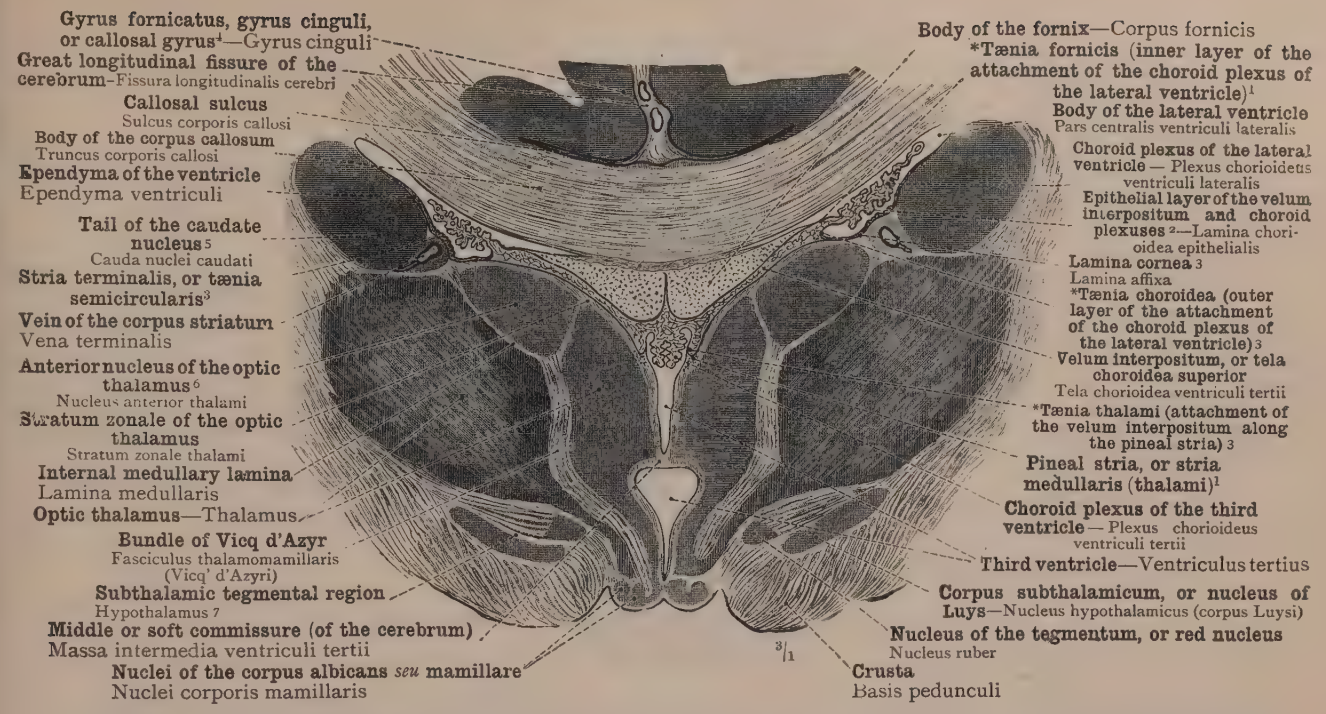
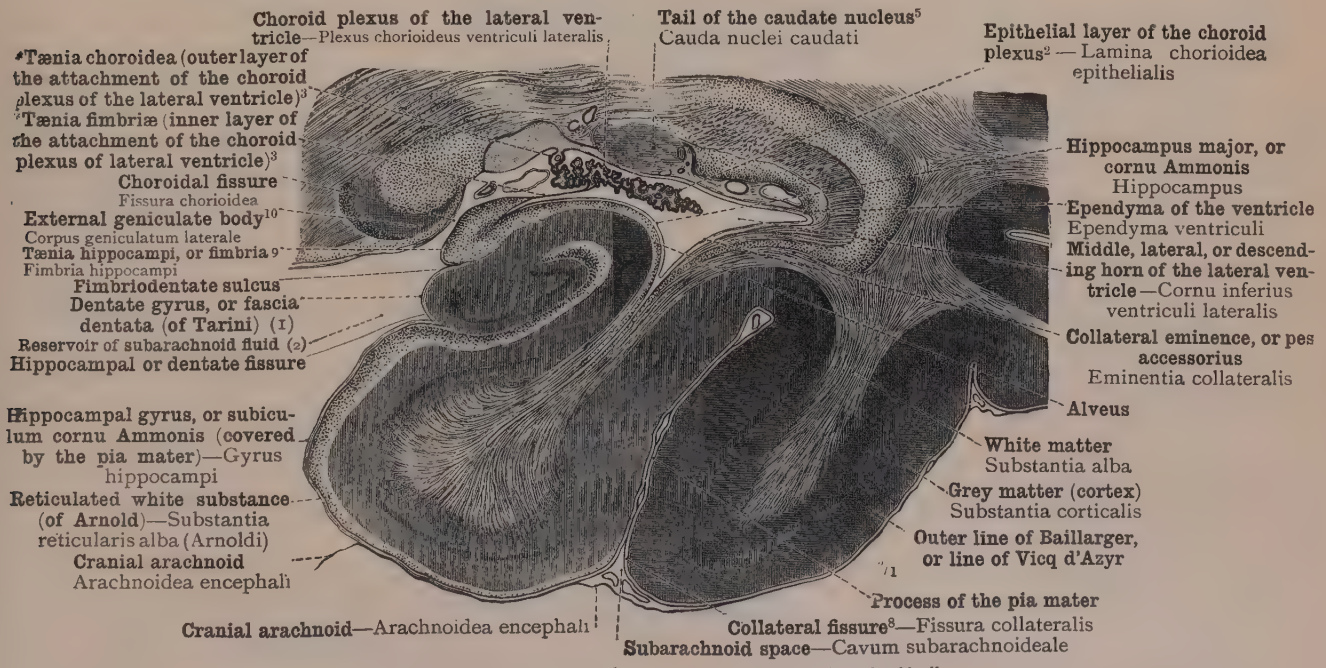

Gyrus fornicatus, gyrus cinguli, or callosal gyrus[4]—Gyrus cinguli
Great longitudinal fissure of the cerebrum—Fissura longitudinalis cerebri
Callosal sulcus
Sulcus corporis callosi
Body of the corpus callosum
Truncus corporis callosi
Ependyma of the ventricle
Ependyma ventriculi
Tail of the caudate nucleus[5]
Cauda nuclei caudati
Stria terminalis, or tænia semicircularis[3]
Vein of the corpus striatum
Vena terminalis
Anterior nucleus of the optic thalamus[6]
Nucleus anterior thalami
Stratum zonale of the optic thalamus
Stratum zonale thalami
Internal medullary lamina
Lamina medullaris
Optic thalamus—Thalamus
Bundle of Vicq d'Azyr
Fasciculus thalamomamillaris (Vicq' d'Azyri)
Subthalamic tegmental region
Hypothalamus 7
Middle or soft commissure (of the cerebrum)
Massa intermedia ventriculi tertii
Nuclei of the corpus albicans *seu* mamillare
Nuclei corporis mamillaris
Body of the fornix—Corpus fornicis
*Tænia fornicis (inner layer of the attachment of the choroid plexus of the lateral ventricle)[1]
Body of the lateral ventricle
Pars centralis ventriculi lateralis
Choroid plexus of the lateral ventricle—Plexus chorioideus ventriculi lateralis
Epithelial layer of the velum interpositum and choroid plexuses[2]—Lamina chorioidea epithelialis
Lamina cornea[3]
Lamina affixa
*Tænia choroidea (outer layer of the attachment of the choroid plexus of the lateral ventricle)[3]
Velum interpositum, or tela choroidea superior
Tela chorioidea ventriculi tertii
*Tænia thalami (attachment of the velum interpositum along the pineal stria)[3]
Pineal stria, or stria medullaris (thalami)[1]
Choroid plexus of the third ventricle—Plexus chorioideus ventriculi tertii
Third ventricle—Ventriculus tertius
Corpus subthalamicum, or nucleus of Luys—Nucleus hypothalamicus (corpus Luysi)
Nucleus of the tegmentum, or red nucleus
Nucleus ruber
Crusta
Basis pedunculi
3/1

FIG. 1204.—CORONAL SECTION THROUGH THE MIDDLE OF THE THIRD VENTRICLE AND THE ADJOINING PARTS OF THE ENCEPHALON. THE VELUM INTERPOSITUM OR TELA CHOROIDEA SUPERIOR AND THE CHOROID PLEXUSES OF THE THIRD AND LATERAL VENTRICLES ARE SEEN IN TRANSVERSE SECTION. THE ATTACHMENT OF THE CHOROID PLEXUS OF THE LATERAL VENTRICLE TO THE OUTER FREE BORDER OF THE FORNIX BY MEANS OF THE *TÆNIA FORNICIS[1]; TO THE LAMINA CORNEA (LAMINA AFFIXA) AND THE EPENDYMA OF THE LATERAL VENTRICLE BY MEANS OF THE *TÆNIA CHOROIDEA (*see Appendix, note* 392); AND, FINALLY, THE ATTACHMENT OF THE LOWER SURFACE OF THE VELUM INTERPOSITUM TO THE PINEAL STRIA (STRIA MEDULLARIS THALAMI) BY MEANS OF THE TÆNIA THALAMI.[1]


Choroid plexus of the lateral ventricle—Plexus chorioideus ventriculi lateralis
Tail of the caudate nucleus[5]
Cauda nuclei caudati
Epithelial layer of the choroid plexus[2]—Lamina chorioidea epithelialis
*Tænia choroidea (outer layer of the attachment of the choroid plexus of the lateral ventricle)[3]
*Tænia fimbriæ (inner layer of the attachment of the choroid plexus of lateral ventricle)[3]
Choroidal fissure
Fissura chorioidea
External geniculate body[10]
Corpus geniculatum laterale
Tænia hippocampi, or fimbria[9]
Fimbria hippocampi
Fimbriodentate sulcus
Dentate gyrus, or fascia dentata (of Tarini) (1)
Reservoir of subarachnoid fluid (2)
Hippocampal or dentate fissure
Hippocampal gyrus, or subiculum cornu Ammonis (covered by the pia mater)—Gyrus hippocampi
Reticulated white substance (of Arnold)—Substantia reticularis alba (Arnoldi)
Cranial arachnoid
Arachnoidea encephali
Hippocampus major, or cornu Ammonis
Hippocampus
Ependyma of the ventricle
Ependyma ventriculi
Middle, lateral, or descending horn of the lateral ventricle—Cornu inferius ventriculi lateralis
Collateral eminence, or pes accessorius
Eminentia collateralis
Alveus
White matter
Substantia alba
Grey matter (cortex)
Substantia corticalis
Outer line of Baillarger, or line of Vicq d'Azyr
Process of the pia mater
Collateral fissure[8]—Fissura collateralis
Subarachnoid space—Cavum subarachnoideale
Cranial arachnoid—Arachnoidea encephali
1/1

(1) Fascia dentata hippocampi (2) Cisterna subarachnoidealis

FIG. 1205.—CORONAL SECTION THROUGH THE MIDDLE, LATERAL, OR DESCENDING HORN OF THE RIGHT LATERAL VENTRICLE AND THE HIPPOCAMPAL GYRUS OR SUBICULUM CORNU AMMONIS. THE CHOROID PLEXUS IS SEEN IN TRANSVERSE SECTION. IT IS CONNECTED WITH THE EPENDYMA OF THE DESCENDING HORN BY MEANS OF THE *TÆNIA CHOROIDEA, AND WITH THE MARGIN OF THE TÆNIA HIPPOCAMPI OR FIMBRIA (FIMBRIA HIPPOCAMPI OR CORPUS FIMBRIATUM) BY MEANS OF THE *TÆNIA FIMBRIÆ (*see Appendix, note* 392).

1 See Appendix, note 392. The **tænia fornicis* of Toldt must not be confused with the *tænia fornicis* of English authors, the latter being also known as the *pineal stria*. See Appendix, notes 359 and 365.
2 Or *epithelium of the plexuses* (Quain). See Appendix, note 374. 3 See Appendix, note 392. 4 See Appendix, note 390.
5 See note 1 to p. 766. 6 Also known as the *nucleus of the anterior tubercle of the optic thalamus*.
7 See Appendix, note 354. 8 Sometimes regarded as the *fourth temporal sulcus*.
9 Called by Macalister the *corpus fimbriatum*. See Appendix, note 392. 10 Or *lateral geniculate body*.

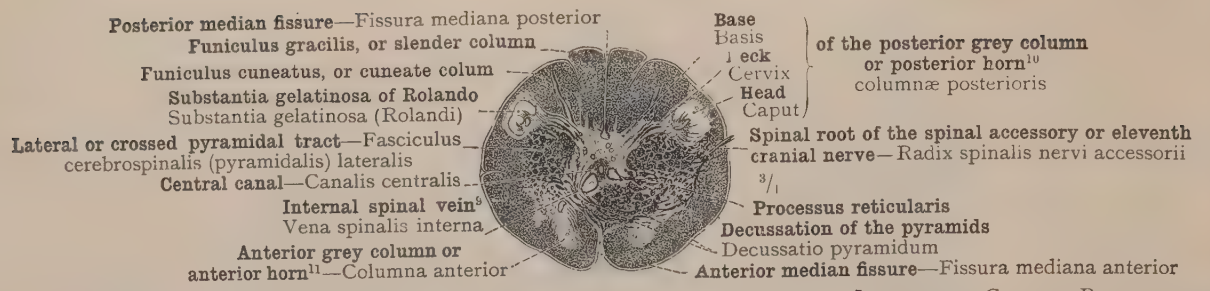


FIG. 1206.—TRANSVERSE SECTION THROUGH THE PYRAMIDAL DECUSSATION. LOWER OR CLOSED PART OF THE MEDULLA OBLONGATA.

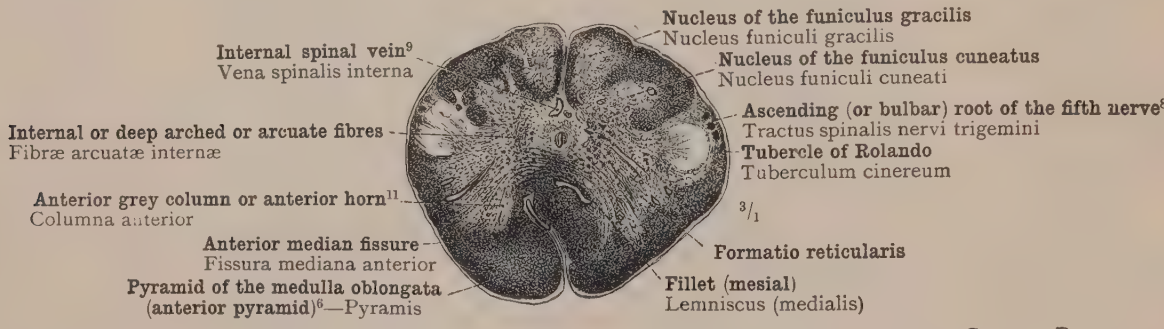


FIG. 1207.—TRANSVERSE SECTION THROUGH THE PYRAMIDS BELOW THE OLIVES. LOWER OR CLOSED PORTION OF THE MEDULLA OBLONGATA.

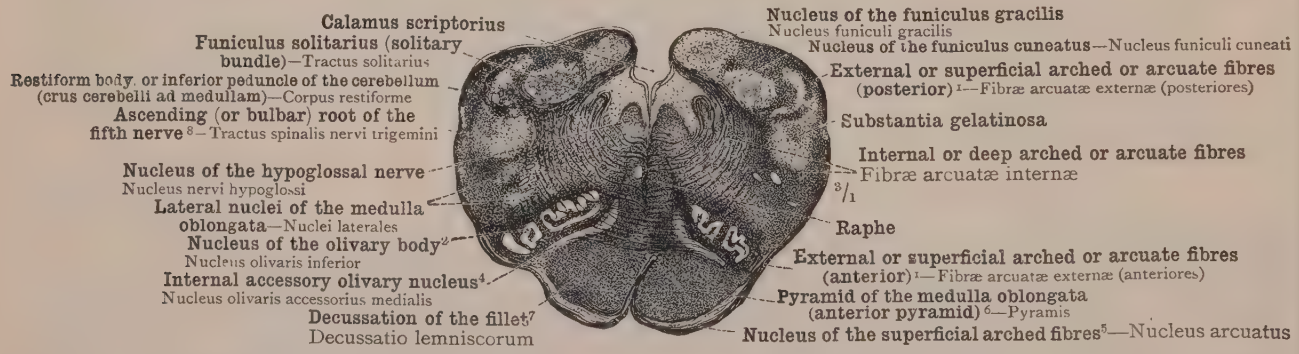

Calamus scriptorius
Funiculus solitarius (solitary bundle)—Tractus solitarius
Restiform body, or inferior peduncle of the cerebellum (crus cerebelli ad medullam)—Corpus restiforme
Ascending (or bulbar) root of the fifth nerve[8]—Tractus spinalis nervi trigemini
Nucleus of the hypoglossal nerve
Nucleus nervi hypoglossi
Lateral nuclei of the medulla oblongata—Nuclei laterales
Nucleus of the olivary body[2]
Nucleus olivaris inferior
Internal accessory olivary nucleus[4]
Nucleus olivaris accessorius medialis
Decussation of the fillet[7]
Decussatio lemniscorum
Nucleus of the funiculus gracilis
Nucleus funiculi gracilis
Nucleus of the funiculus cuneatus—Nucleus funiculi cuneati
External or superficial arched or arcuate fibres (posterior)[1]—Fibræ arcuatæ externæ (posteriores)
Substantia gelatinosa
Internal or deep arched or arcuate fibres
Fibræ arcuatæ internæ
3/1
Raphe
External or superficial arched or arcuate fibres (anterior)[1]—Fibræ arcuatæ externæ (anteriores)
Pyramid of the medulla oblongata (anterior pyramid)[6]—Pyramis
Nucleus of the superficial arched fibres[5]—Nucleus arcuatus

FIG. 1208.—TRANSVERSE SECTION THROUGH THE LOWER EXTREMITY OF THE OLIVARY BODY OR LOWER OLIVE. LOWER PART OF THE FLOOR OF THE FOURTH VENTRICLE (PARS INFERIOR FOSSÆ RHOMBOIDEÆ—*see Appendix, note* [355]).

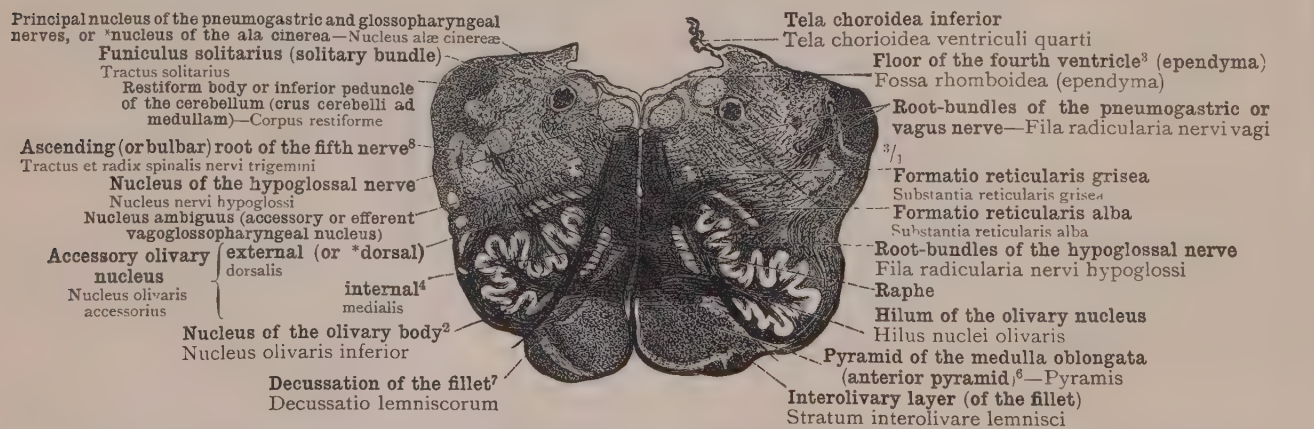
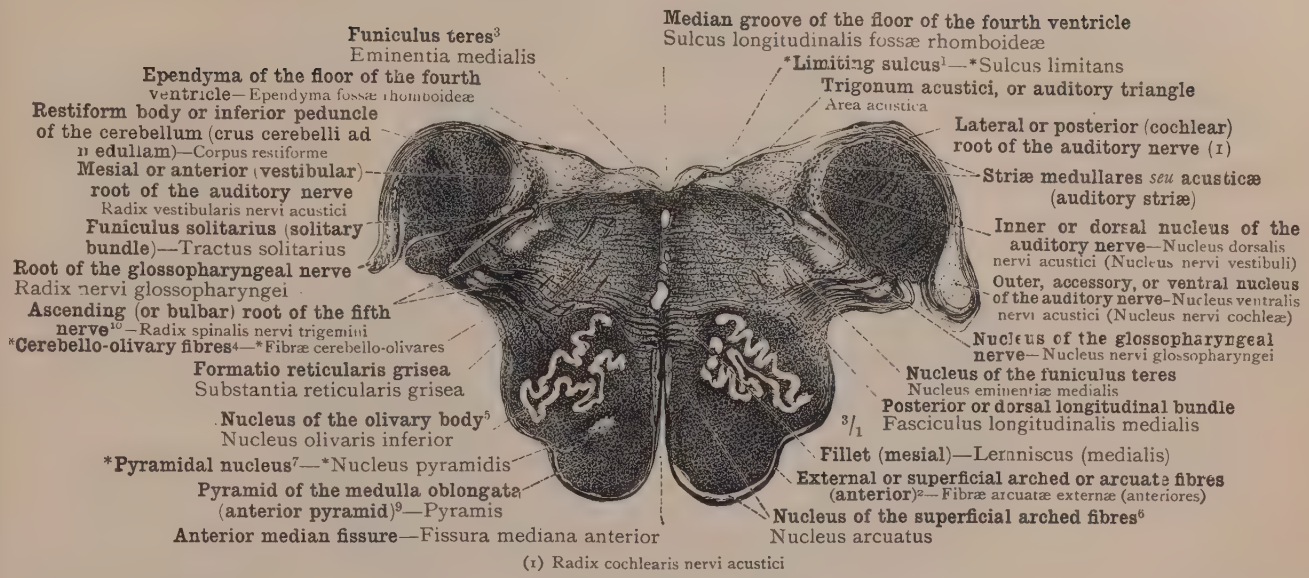

Principal nucleus of the pneumogastric and glossopharyngeal nerves, or *nucleus of the ala cinerea—Nucleus alæ cinereæ
Funiculus solitarius (solitary bundle)
Tractus solitarius
Restiform body or inferior peduncle of the cerebellum (crus cerebelli ad medullam)—Corpus restiforme
Ascending (or bulbar) root of the fifth nerve[8]
Tractus et radix spinalis nervi trigemini
Nucleus of the hypoglossal nerve
Nucleus nervi hypoglossi
Nucleus ambiguus (accessory or efferent vagoglossopharyngeal nucleus)
Accessory olivary nucleus
Nucleus olivaris accessorius
external (or *dorsal)
dorsalis
internal[4]
medialis
Nucleus of the olivary body[2]
Nucleus olivaris inferior
Decussation of the fillet[7]
Decussatio lemniscorum
Tela choroidea inferior
Tela chorioidea ventriculi quarti
Floor of the fourth ventricle[3] (ependyma)
Fossa rhomboidea (ependyma)
Root-bundles of the pneumogastric or vagus nerve—Fila radicularia nervi vagi
3/1
Formatio reticularis grisea
Substantia reticularis grisea
Formatio reticularis alba
Substantia reticularis alba
Root-bundles of the hypoglossal nerve
Fila radicularia nervi hypoglossi
Raphe
Hilum of the olivary nucleus
Hilus nuclei olivaris
Pyramid of the medulla oblongata (anterior pyramid)[6]—Pyramis
Interolivary layer (of the fillet)
Stratum interolivare lemnisci

FIG 1209.—TRANSVERSE SECTION THROUGH THE MIDDLE OF THE OLIVARY BODY OR LOWER OLIVE. LOWER PART OF THE FLOOR OF THE FOURTH VENTRICLE (PARS INFERIOR FOSSÆ RHOMBOIDEÆ—*see Appendix, note* [355]).

TRANSVERSE SECTIONS THROUGH THE MEDULLA OBLONGATA. (THE WHITE MATTER IS SHADED, THE GREY MATTER UNSHADED.)

1 See Appendix, note 393.
2 Or (*inferior*) *olivary nucleus*; also known as the *corpus dentatum of the olive*. See Appendix, note 385.
3 See Appendix, note 355. 4 By Macalister called the *internal parolivary nucleus*.
5 By Macalister called *nucleus arciformis*. 6 See Appendix, note 363. 7 See Appendix, note 394.
8 Called by Gowers the *lower root*. 9 See Appendix to Part V., note 298.
10 Or *basis cornu posterioris*, *cervix cornu posterioris*, and *caput cornu posterioris*. Regarding the use of the term *posterior grey column*, see Appendix, note 339. 11 See Appendix, note 339.

Transverse Sections through the Brain.


Median groove of the floor of the fourth ventricle
Sulcus longitudinalis fossæ rhomboideæ
Funiculus teres[3]
Eminentia medialis
*Limiting sulcus[1]—*Sulcus limitans
Ependyma of the floor of the fourth ventricle—Ependyma fossæ rhomboideæ
Trigonum acustici, or auditory triangle
Area acustica
Restiform body or inferior peduncle of the cerebellum (crus cerebelli ad medullam)—Corpus restiforme
Lateral or posterior (cochlear) root of the auditory nerve (1)
Mesial or anterior (vestibular) root of the auditory nerve
Radix vestibularis nervi acustici
Striæ medullares seu acusticæ (auditory striæ)
Funiculus solitarius (solitary bundle)—Tractus solitarius
Inner or dorsal nucleus of the auditory nerve—Nucleus dorsalis nervi acustici (Nucleus nervi vestibuli)
Root of the glossopharyngeal nerve
Radix nervi glossopharyngei
Outer, accessory, or ventral nucleus of the auditory nerve—Nucleus ventralis nervi acustici (Nucleus nervi cochleæ)
Ascending (or bulbar) root of the fifth nerve[10]—Radix spinalis nervi trigemini
*Cerebello-olivary fibres[4]—*Fibræ cerebello-olivares
Nucleus of the glossopharyngeal nerve—Nucleus nervi glossopharyngei
Formatio reticularis grisea
Substantia reticularis grisea
Nucleus of the funiculus teres
Nucleus eminentiæ medialis
Posterior or dorsal longitudinal bundle
Fasciculus longitudinalis medialis
Nucleus of the olivary body[5]
Nucleus olivaris inferior
3/1
*Pyramidal nucleus[7]—*Nucleus pyramidis
Fillet (mesial)—Lemniscus (medialis)
Pyramid of the medulla oblongata (anterior pyramid)[9]—Pyramis
External or superficial arched or arcuate fibres (anterior)[2]—Fibræ arcuatæ externæ (anteriores)
Anterior median fissure—Fissura mediana anterior
Nucleus of the superficial arched fibres[6]
Nucleus arcuatus

(1) Radix cochlearis nervi acustici

FIG. 1210.—TRANSVERSE SECTION THROUGH THE MEDULLA OBLONGATA, AT THE LEVEL OF THE UPPER EXTREMITY OF THE OLIVARY BODY OR LOWER OLIVE, TRAVERSING THE TRIGONUM ACUSTICI OR AUDITORY TRIANGLE. MIDDLE OR INTERMEDIATE PORTION OF THE FLOOR OF THE FOURTH VENTRICLE (PARS INTERMEDIA FOSSÆ RHOMBOIDEÆ—*see Appendix, note* [355]).

The white matter is shaded, the grey matter unshaded.

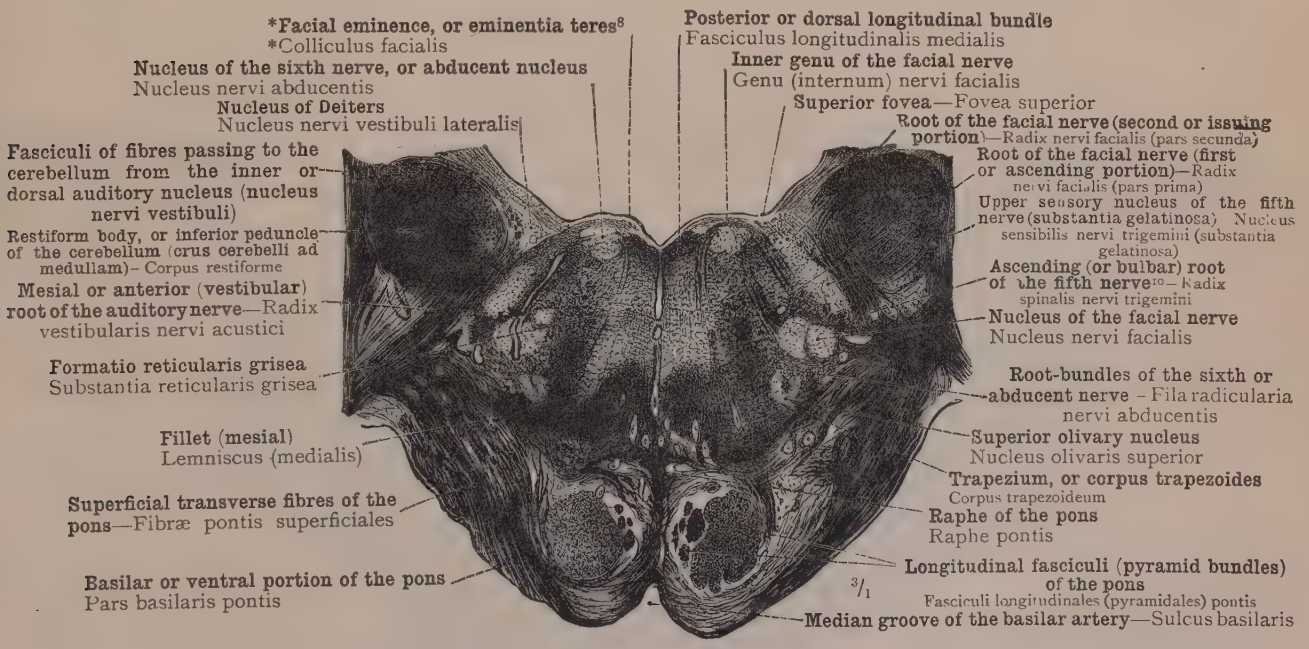

*Facial eminence, or eminentia teres[8]
*Colliculus facialis
Posterior or dorsal longitudinal bundle
Fasciculus longitudinalis medialis
Nucleus of the sixth nerve, or abducent nucleus
Nucleus nervi abducentis
Inner genu of the facial nerve
Genu (internum) nervi facialis
Nucleus of Deiters
Nucleus nervi vestibuli lateralis
Superior fovea—Fovea superior
Root of the facial nerve (second or issuing portion)—Radix nervi facialis (pars secunda)
Fasciculi of fibres passing to the cerebellum from the inner or dorsal auditory nucleus (nucleus nervi vestibuli)
Root of the facial nerve (first or ascending portion)—Radix nervi facialis (pars prima)
Upper sensory nucleus of the fifth nerve (substantia gelatinosa) Nucleus sensibilis nervi trigemini (substantia gelatinosa)
Restiform body, or inferior peduncle of the cerebellum (crus cerebelli ad medullam)—Corpus restiforme
Ascending (or bulbar) root of the fifth nerve[10]—Radix spinalis nervi trigemini
Mesial or anterior (vestibular) root of the auditory nerve—Radix vestibularis nervi acustici
Nucleus of the facial nerve
Nucleus nervi facialis
Formatio reticularis grisea
Substantia reticularis grisea
Root-bundles of the sixth or abducent nerve—Fila radicularia nervi abducentis
Fillet (mesial)
Lemniscus (medialis)
Superior olivary nucleus
Nucleus olivaris superior
Trapezium, or corpus trapezoides
Corpus trapezoideum
Superficial transverse fibres of the pons—Fibræ pontis superficiales
Raphe of the pons
Raphe pontis
Longitudinal fasciculi (pyramid bundles) of the pons
Fasciculi longitudinales (pyramidales) pontis
Basilar or ventral portion of the pons
Pars basilaris pontis
3/1
Median groove of the basilar artery—Sulcus basilaris

FIG. 1211.—TRANSVERSE SECTION THROUGH THE LOWER BORDER OF THE PONS VAROLII AND THE *FACIAL EMINENCE OR EMINENTIA TERES (*COLLICULUS FACIALIS—*see Appendix, note* [376]). MIDDLE OR INTERMEDIATE PORTION OF THE FLOOR OF THE FOURTH VENTRICLE (PARS INTERMEDIA FOSSÆ RHOMBOIDEÆ—*see Appendix, note* [355]).

The white matter is shaded, the grey matter unshaded.

1 See Appendix, note 377. 2 See Appendix, note 393. 3 See Appendix, note 376. 4 See Appendix, note 395.
5 Or (*inferior*) *olivary nucleus*; also known as the *corpus dentatum of the olive*. See Appendix, note 385.
6 By Macalister called *nucleus arciformis*. 7 See Appendix, note 395. 8 See Appendix, note 376.
9 See Appendix, note 363. 10 Called by Gowers the *lower root*.

Transverse Sections through the Brain.

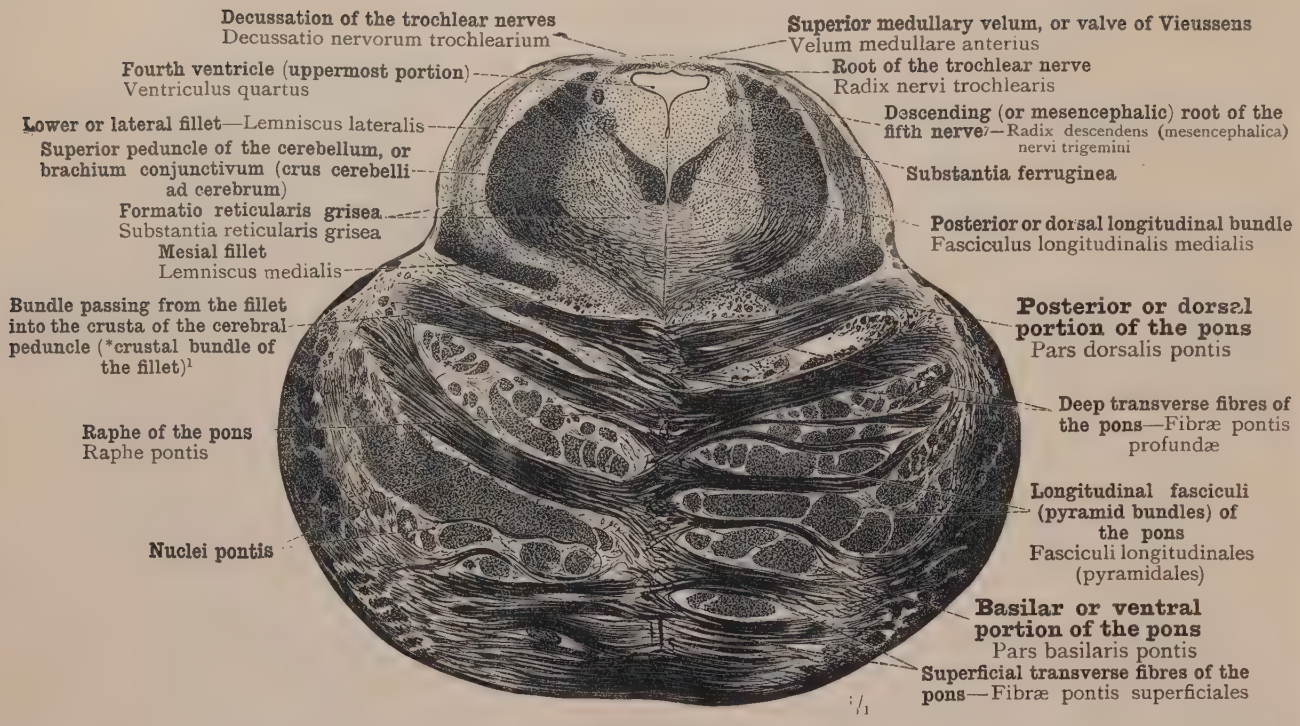

Decussation of the trochlear nerves
Decussatio nervorum trochlearium
Superior medullary velum, or valve of Vieussens
Velum medullare anterius
Fourth ventricle (uppermost portion)
Ventriculus quartus
Root of the trochlear nerve
Radix nervi trochlearis
Lower or lateral fillet—Lemniscus lateralis
Descending (or mesencephalic) root of the fifth nerve7—Radix descendens (mesencephalica) nervi trigemini
Superior peduncle of the cerebellum, or brachium conjunctivum (crus cerebelli ad cerebrum)
Substantia ferruginea
Formatio reticularis grisea
Substantia reticularis grisea
Posterior or dorsal longitudinal bundle
Fasciculus longitudinalis medialis
Mesial fillet
Lemniscus medialis
Bundle passing from the fillet into the crusta of the cerebral peduncle (*crustal bundle of the fillet)1
Posterior or dorsal portion of the pons
Pars dorsalis pontis
Deep transverse fibres of the pons—Fibræ pontis profundæ
Raphe of the pons
Raphe pontis
Longitudinal fasciculi (pyramid bundles) of the pons
Fasciculi longitudinales (pyramidales)
Nuclei pontis
Basilar or ventral portion of the pons
Pars basilaris pontis
Superficial transverse fibres of the pons—Fibræ pontis superficiales
1/1

FIG. 1212.—TRANSVERSE SECTION THROUGH THE MIDDLE OF THE PONS VAROLII AND THE SUPERIOR MEDULLARY VELUM, OR VALVE OF VIEUSSENS. *ISTHMUS RHOMBENCEPHALI (*see Appendix, note* 369); UPPER PORTION OF THE FLOOR OF THE FOURTH VENTRICLE (PARS SUPERIOR FOSSÆ RHOMBOIDEÆ—*see Appendix, note* 355).

White matter shaded, grey matter unshaded.

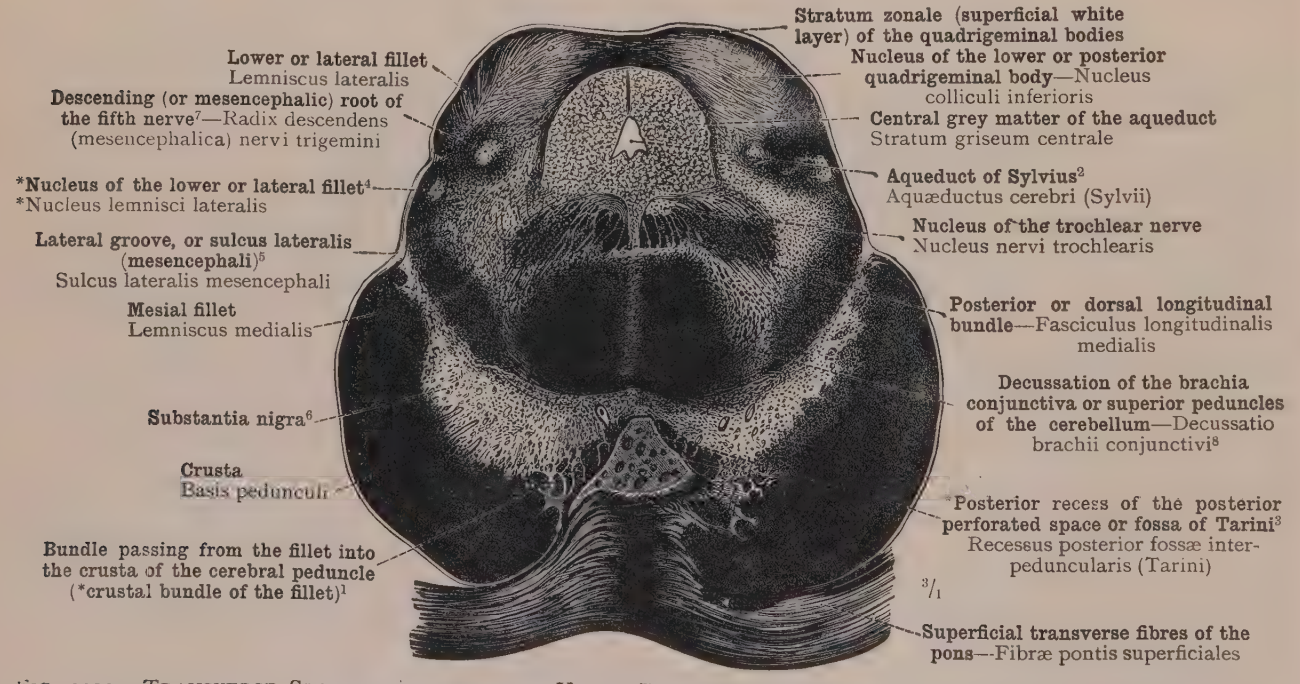

Stratum zonale (superficial white layer) of the quadrigeminal bodies
Lower or lateral fillet
Lemniscus lateralis
Nucleus of the lower or posterior quadrigeminal body—Nucleus colliculi inferioris
Descending (or mesencephalic) root of the fifth nerve7—Radix descendens (mesencephalica) nervi trigemini
Central grey matter of the aqueduct
Stratum griseum centrale
*Nucleus of the lower or lateral fillet4
*Nucleus lemnisci lateralis
Aqueduct of Sylvius2
Aquæductus cerebri (Sylvii)
Lateral groove, or sulcus lateralis (mesencephali)5
Sulcus lateralis mesencephali
Nucleus of the trochlear nerve
Nucleus nervi trochlearis
Mesial fillet
Lemniscus medialis
Posterior or dorsal longitudinal bundle—Fasciculus longitudinalis medialis
Decussation of the brachia conjunctiva or superior peduncles of the cerebellum—Decussatio brachii conjunctivi8
Substantia nigra6
Crusta
Basis pedunculi
Posterior recess of the posterior perforated space or fossa of Tarini3
Recessus posterior fossæ interpeduncularis (Tarini)
Bundle passing from the fillet into the crusta of the cerebral peduncle (*crustal bundle of the fillet)1
3/1
Superficial transverse fibres of the pons—Fibræ pontis superficiales

FIG. 1213.—TRANSVERSE SECTION THROUGH THE UPPER BORDER OF THE PONS VAROLII, PASSING THROUGH THE HINDMOST PORTION OF THE CRURA CEREBRI OR CEREBRAL PEDUNCLES AND THE LOWER OR POSTERIOR CORPORA QUADRIGEMINA. MID-BRAIN OR MESENCEPHALON.

White matter shaded, grey matter unshaded.

1 See Appendix, note 397. 2 Or *iter a tertio ad quartum ventriculum.* 3 See Appendix, note 302.
4 See Appendix, note 398. 5 See Appendix, note 369. 6 Called by Macalister the *locus niger*
7 Called by Gowers the *upper root.* 8 See note 11 to p. 772.

Transverse Sections through the Brain.

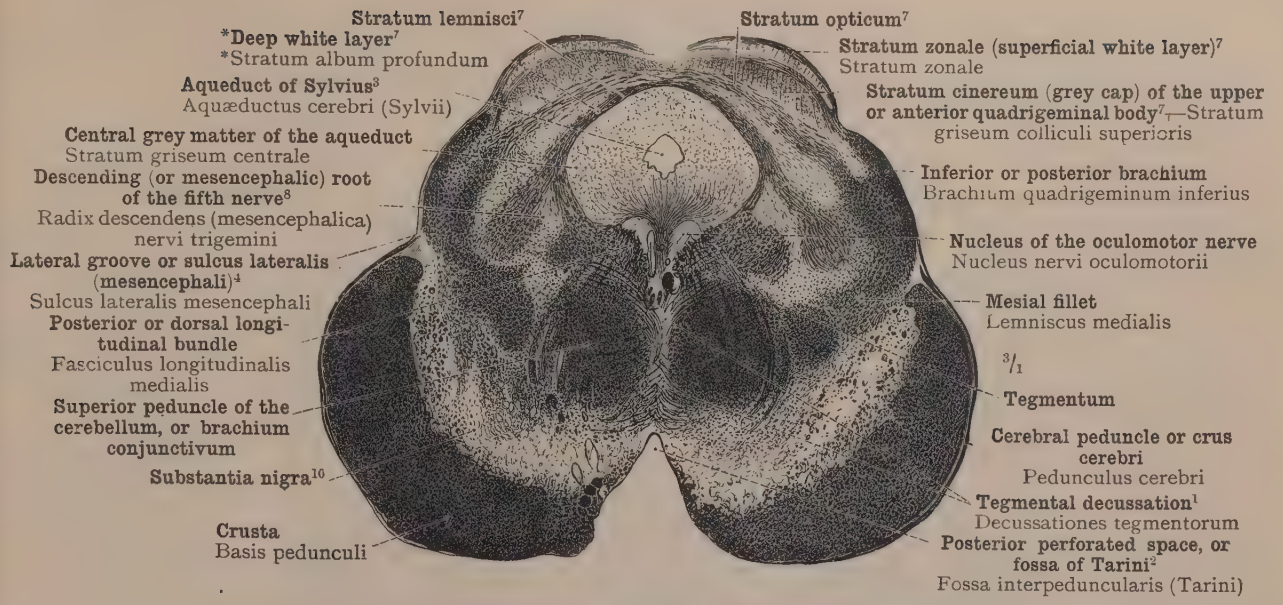


FIG. 1214.—TRANSVERSE SECTION THROUGH THE MIDDLE OF THE CEREBRAL PEDUNCLE OR CRUS CEREBRI, THROUGH THE TEGMENTUM, AND THROUGH THE UPPER OR ANTERIOR QUADRIGEMINAL BODIES. MID-BRAIN OR MESENCEPHALON.

White matter shaded, grey matter unshaded.

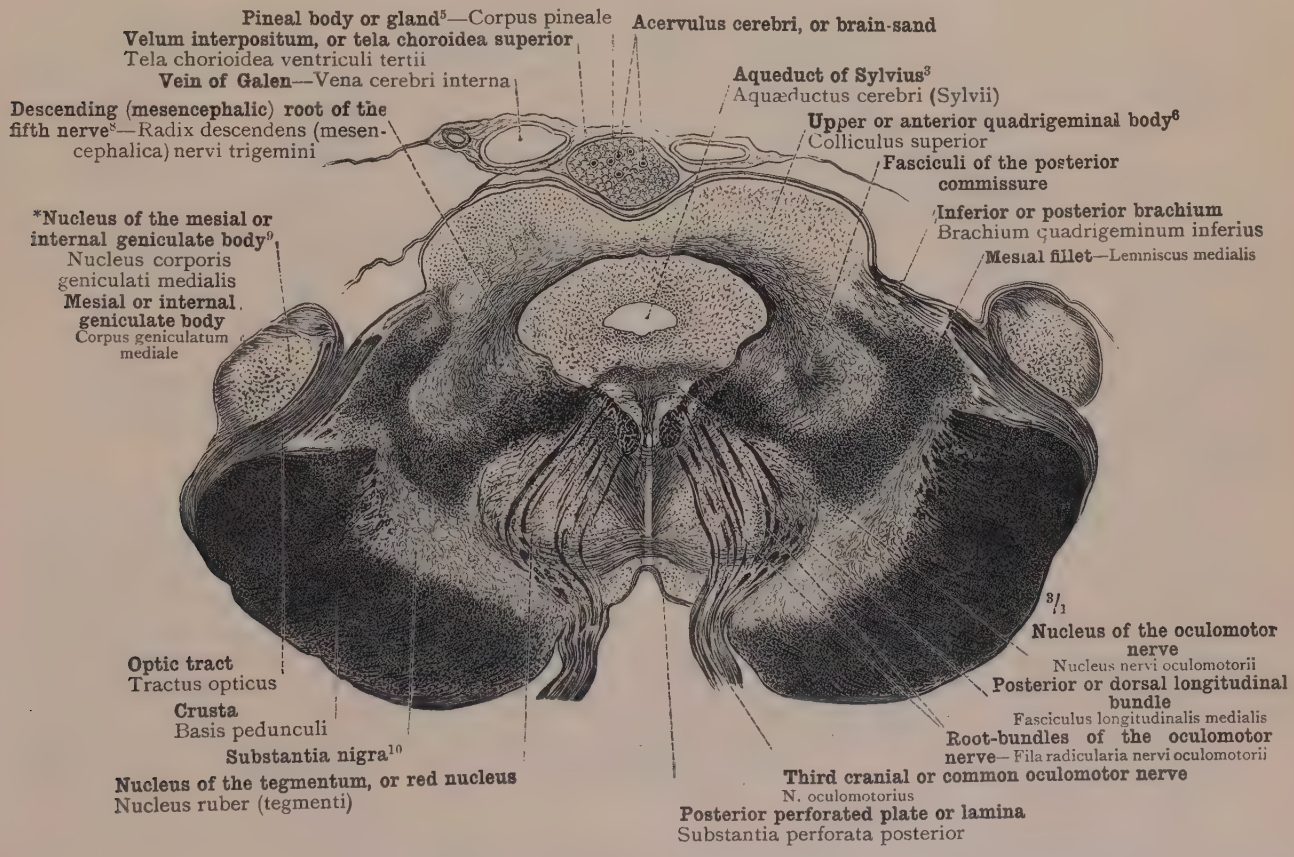

Pineal body or gland[5]—Corpus pineale
Velum interpositum, or tela choroidea superior
Tela chorioidea ventriculi tertii
Vein of Galen—Vena cerebri interna
Acervulus cerebri, or brain-sand
Aqueduct of Sylvius[3]
Aquæductus cerebri (Sylvii)
Descending (mesencephalic) root of the fifth nerve[8]—Radix descendens (mesencephalica) nervi trigemini
Upper or anterior quadrigeminal body[6]
Colliculus superior
Fasciculi of the posterior commissure
*Nucleus of the mesial or internal geniculate body[9]
Nucleus corporis geniculati medialis
Mesial or internal geniculate body
Corpus geniculatum mediale
Inferior or posterior brachium
Brachium quadrigeminum inferius
Mesial fillet—Lemniscus medialis
3/1
Nucleus of the oculomotor nerve
Nucleus nervi oculomotorii
Posterior or dorsal longitudinal bundle
Fasciculus longitudinalis medialis
Root-bundles of the oculomotor nerve—Fila radicularia nervi oculomotorii
Optic tract
Tractus opticus
Crusta
Basis pedunculi
Substantia nigra[10]
Nucleus of the tegmentum, or red nucleus
Nucleus ruber (tegmenti)
Third cranial or common oculomotor nerve
N. oculomotorius
Posterior perforated plate or lamina
Substantia perforata posterior

FIG. 1215.—TRANSVERSE SECTION THROUGH THE FRONT OF THE CEREBRAL PEDUNCLE OR CRUS CEREBRI, THROUGH THE NUCLEUS OF THE TEGMENTUM OR RED NUCLEUS, THROUGH THE UPPER OR ANTERIOR QUADRIGEMINAL BODIES AND THE PINEAL BODY OR GLAND (*see note* [5] *below*). MID-BRAIN OR MESENCEPHALON, ADJACENT TO THE INTERBRAIN OR THALAMENCEPHALON.

White matter shaded, grey matter unshaded.

1 See Appendix, note 399.
2 See Appendix, note 362.
3 Or *iter a tertio ad quartum ventriculum.*
4 See Appendix, note 369.
5 Known also as the *conarium* and as the *epiphysis cerebri.* See Appendix, note 365.
6 See Appendix, note 372.
7 See Appendix, note 400.
8 Called by Gowers the *upper root.*
9 *Nuclei of the Geniculate Bodies.*—The grey matter in the interior of the geniculate bodies is called by Toldt the *nuclei* of these bodies. The name is not used by Quain.
10 Called by Macalister the *locus niger.*

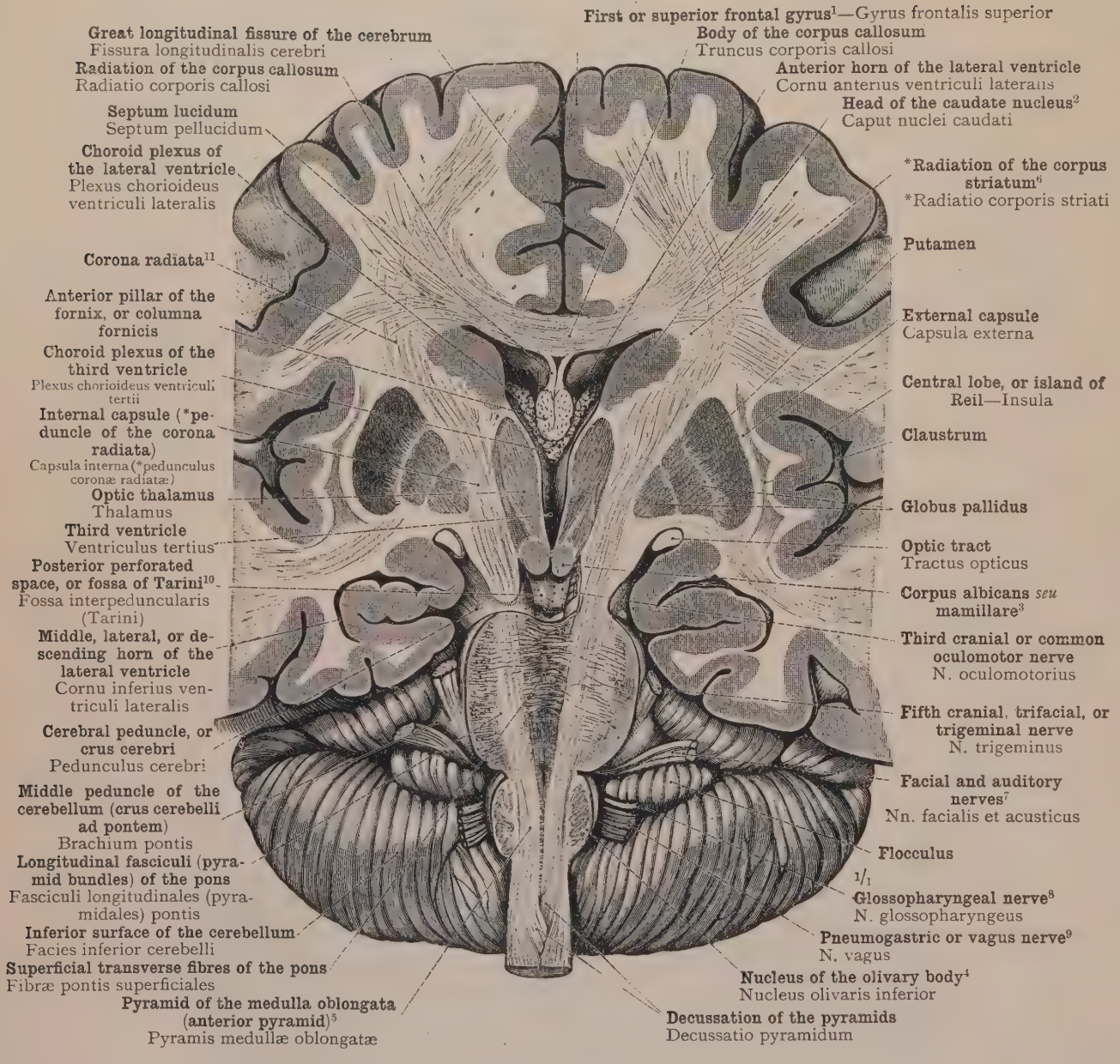


FIG. 1216.—TRANSVERSE SECTION THROUGH THE BRAIN IN THE DIRECTION OF THE MEDULLA OBLONGATA AND THE CEREBRAL PEDUNCLES OR CRURA CEREBRI. THE COURSE OF THE PYRAMIDAL TRACT FROM THE DECUSSATION OF THE PYRAMIDS UPWARDS, THROUGH THE PYRAMID OF THE MEDULLA OBLONGATA (ANTERIOR PYRAMID—*see Appendix, note* [363]), THE PONS VAROLII, AND THE CRUSTA OF THE CEREBRAL PEDUNCLE OR CRUS CEREBRI, INTO THE INTERNAL CAPSULE, WHERE IT ENTERS THE *PEDUNCLE OF THE CORONA RADIATA, PEDUNCULUS CORONÆ RADIATÆ. IN THE MEDULLARY CENTRE OR WHITE MATTER OF THE CEREBRUM (MEDITULLIUM), WE SEE THE INTERLACEMENT OF THE RADIATION OF THE CORPUS CALLOSUM (RADIATIO CORPORIS CALLOSI) WITH THE FIBRES OF THE CORONA RADIATA AS THEY DIVERGE FROM THE INTERNAL CAPSULE, AND WITH THE FIBRES OF THE *RADIATION OF THE CORPUS STRIATUM (RADIATIO CORPORIS STRIATI—*see Appendix, note* [401]).

[1] See Appendix, note [388]. [2] See note [1] to p. 766. [3] Also known as the *bulb of the fornix*.
[4] Or (*inferior*) *olivary nucleus*; also known as the *corpus dentatum of the olive*. See Appendix, note [385].
[5] See Appendix, note [363]. [6] See Appendix, note [401].
[7] In Soemmerring's enumeration, the *facial* is the *seventh*, the *auditory* the *eighth cranial nerve*; in that of Willis the former is the *portio dura*, the latter the *portio mollis*, of the *seventh cranial nerve*.
[8] *Ninth cranial nerve* in Soemmerring's enumeration; *first trunk* of the *eighth cranial nerve* in that of Willis.
[9] *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.
[10] See Appendix, note [362]. [11] Or *fibrous cone* (Mayo).

Transverse Section through the Brain.

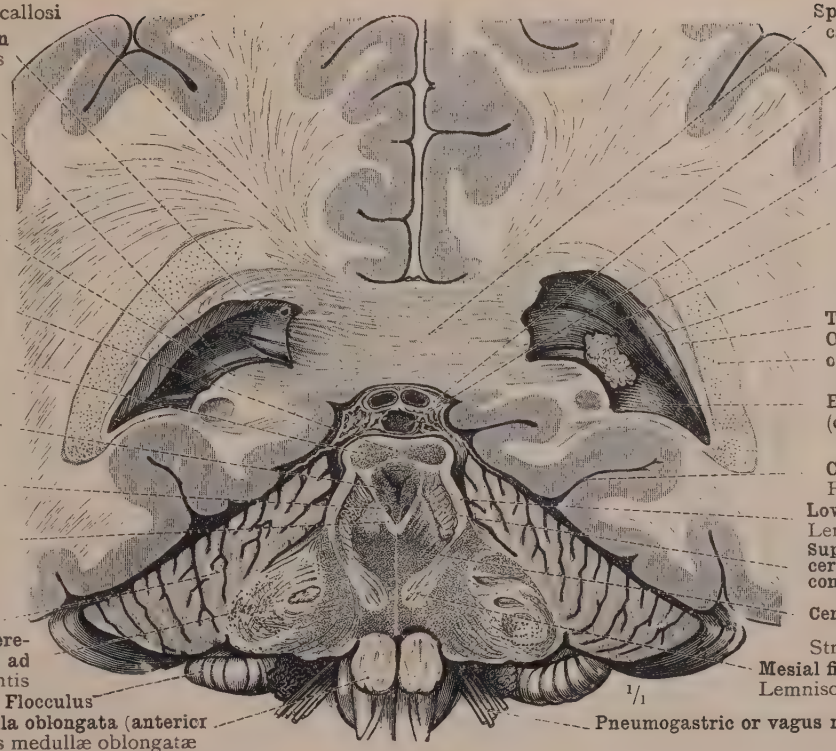

Radiation of the corpus callosum
Radiatio corporis callosi
Bulb of the posterior horn
Bulbus cornu posterioris
Calcar avis, or hippocampus minor[3]
Hippocampus major, or cornu Ammonis
Hippocampus
Quadrigeminal bodies, or optic lobes[4]
Copora quadrigemina
Nucleus of the lower or posterior quadrigeminal body—Nucleus colliculi inferioris
Aqueduct of Sylvius[11]
Aquæductus cerebri
Nucleus of the trochlear nerve—Nucleus nervi trochlearis
Posterior or dorsal longitudinal bundle
Fasciculus longitudinalis medialis
Cerebellum
Middle peduncle of the cerebellum (crus cerebelli ad pontem)—Brachium pontis
Flocculus
Pyramid of the medulla oblongata (anterior pyramid)[12]—Pyramis medullæ oblongatæ
Splenium of the corpus callosum—Splenium corporis callosi
Velum interpositum, or tela choroidea superior
Tela chorioidea ventriculi tertii
Pineal body or gland[9]
Corpus pineale
Posterior horn of the lateral ventricle
Cornu posterius ventriculi lateralis
Choroidal glomerulus[1]
Glomus chorioideum
Tapetum
Optic radiation (of Gratiolet)—Radiatio occipitothalamica
Eminentia collateralis (collateral eminence), or pes accessorius
Collateral fissure[2]
Fissura collateralis
Lower or lateral fillet
Lemniscus lateralis
Superior peduncle of the cerebellum, or brachium conjunctivum (crus cerebelli ad cerebrum)
Central grey matter of the aqueduct
Stratum griseum centrale
Mesial fillet
Lemniscus medialis
Pneumogastric or vagus nerve[10]
1/1

FIG. 1217.—CORONAL SECTION, PASSING BEHIND THE PONS VAROLII, THROUGH THE UPPER EXTREMITIES OF THE PYRAMIDS AND THROUGH THE SPLENIUM OF THE CORPUS CALLOSUM. ANTERIOR SURFACE OF POSTERIOR SEGMENT. A VIEW IS OBTAINED INTO THE POSTERIOR HORNS OF THE LATERAL VENTRICLES.

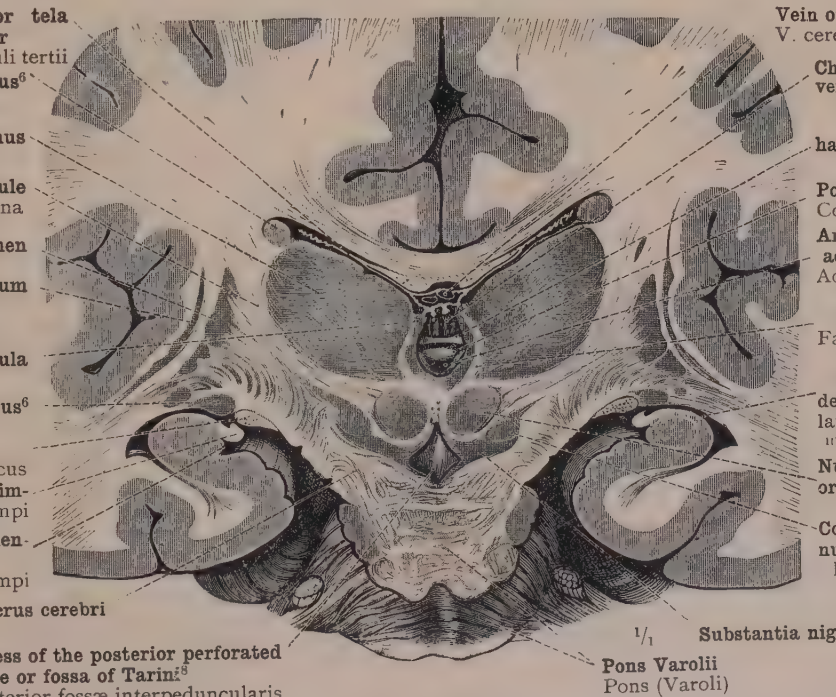
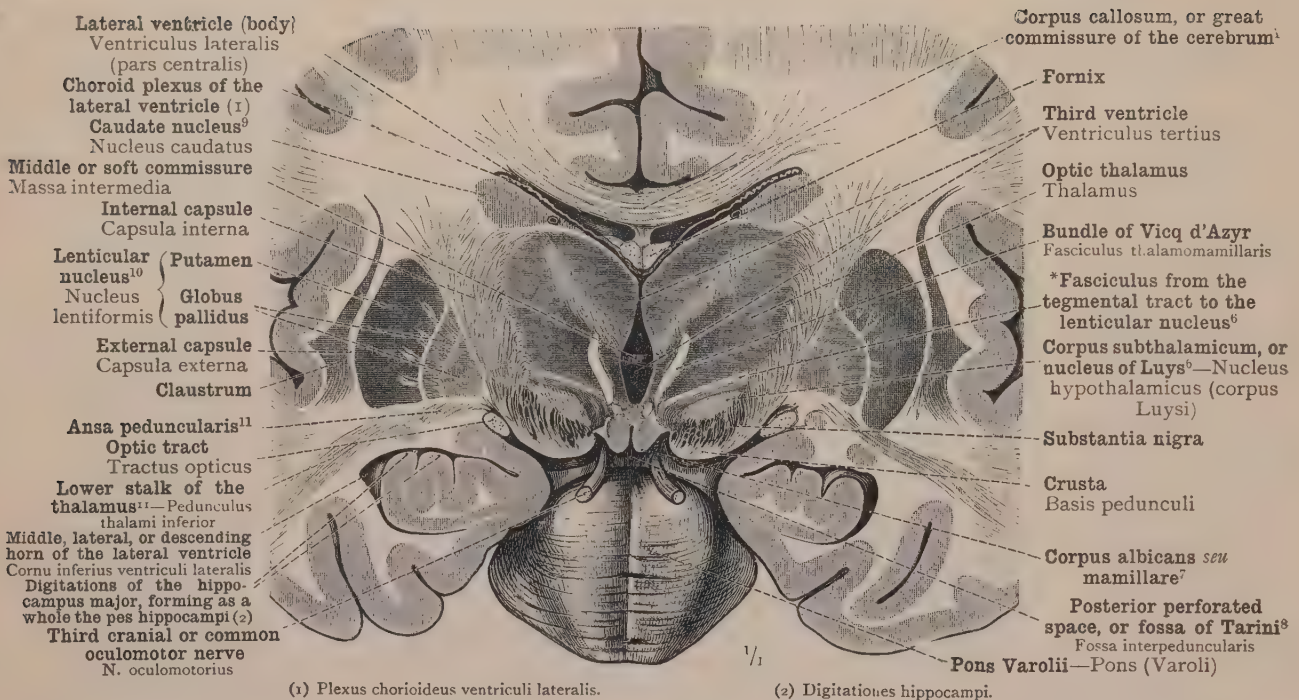

Velum interpositum, or tela choroidea superior
Tela chorioidea ventriculi tertii
Tail of the caudate nucleus[6]
Cauda nuclei caudati
Optic thalamus
Thalamus
Internal capsule
Capsula interna
Putamen
Claustrum
Ganglion of the habenula
Nucleus habenulæ
Tail of the caudate nucleus[6]
Cauda nuclei caudati
Optic tract
Tractus opticus
Tænia hippocampi, or fimbria[7]—Fimbria hippocampi
Dentate gyrus or fascia dentata (of Tarini)
Fascia dentata hippocampi
Cerebral peduncle, or crus cerebri
Pedunculus cerebri
*Posterior recess of the posterior perforated space or fossa of Tarini[8]
*Recessus posterior fossæ interpeduncularis
Vein of Galen
V. cerebri interna
Choroid plexus of the third ventricle—Plexus chorioideus ventriculi tertii
*Commissure of the habenulæ[5]—*Commissura habenularum
Posterior commissure
Commissura posterior
Anterior extremity of the aqueduct of Sylvius[14]
Aditus ad aquæductum cerebri
Meynert's bundle
Fasciculus retroflexus (Meynerti)
Middle, lateral, or descending horn of the lateral ventricle—Cornu inferius ventriculi lateralis
Nucleus of the tegmentum, or red nucleus—Nucleus ruber
Corpus subthalamicum, or nucleus of Luys[13]—Nucleus hypothalamicus (corpus Luysi)
1/1
Substantia nigra
Pons Varolii
Pons (Varoli)

FIG. 1218.—CORONAL SECTION, PASSING THROUGH THE ANTERIOR PORTION OF THE PONS VAROLII, THE OPTIC THALAMI, AND THE POSTERIOR EXTREMITY OF THE LENTICULAR NUCLEUS. ANTERIOR SURFACE OF POSTERIOR SEGMENT. A VIEW IS OBTAINED OF THE POSTERIOR WALL OF THE THIRD VENTRICLE. THE CENTRAL PORTION OR BODY AND THE MIDDLE, LATERAL, OR DESCENDING HORN OF THE LATERAL VENTRICLE ARE CUT ACROSS BY THE SECTION.

1 See note 3 to p. 781. 2 Sometimes regarded as the *fourth temporal sulcus*.
3 Or *ergot* (Morand). 4 See note 5 to p. 760.
5 *Middle* of the *upper* or *dorsal* portion of the *pedunculus conarii* or *habenula* (Quain), or *transverse frænulum of the pineal body* (Macalister). See Appendix, note 365. 6 See note 1 to p. 766. 8 See Appendix, note 362.
7 Called by Macalister the *corpus fimbriatum*. See Appendix, note 392.
9 Known also as the *conarium* and as the *epiphysis cerebri*. See Appendix, note 365.
10 *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.
11 Or *iter a tertio ad quartum ventriculum*. 12 See Appendix, note 363. 13 See Appendix, note 400.



(1) Plexus chorioideus ventriculi lateralis. (2) Digitationes hippocampi.

FIG. 1219.—CORONAL SECTION IN FRONT OF THE PONS, PASSING THROUGH THE CRURA CEREBRI OR CEREBRAL PEDUNCLES AND THE CORPORA MAMILLARIA *SEU* ALBICANTIA. ANTERIOR SURFACE OF POSTERIOR SEGMENT. THE THIRD VENTRICLE IS CUT ACROSS, ALSO THE BODY AND THE DESCENDING HORN OF THE LATERAL VENTRICLE; THE DESCENDING HORN IS DIVIDED CLOSE TO ITS ANTERIOR EXTREMITY.

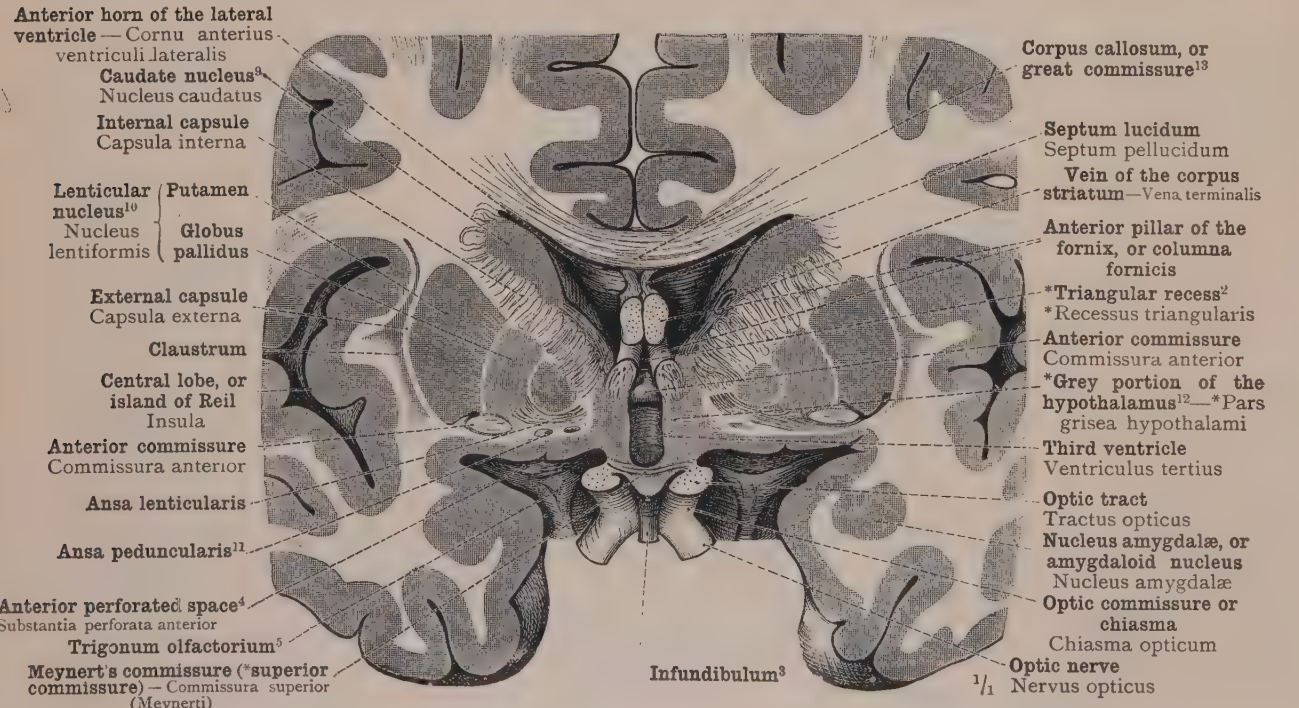


FIG. 1220.—CORONAL SECTION BEHIND THE OPTIC COMMISSURE OR CHIASMA, PASSING THROUGH THE INFUNDIBULUM AND THE ANTERIOR PILLARS OF THE FORNIX OR COLUMNÆ FORNICIS. POSTERIOR SURFACE OF ANTERIOR SEGMENT. A VIEW IS OBTAINED OF THE INTERIOR OF THE ANTERIOR HORNS OF THE LATERAL VENTRICLES, AND THE ANTERIOR WALL OF THE THIRD VENTRICLE IS DISPLAYED.

1 Formerly known as *trabs cerebri*. 2 See Appendix, note 389. 3 See Appendix, note 361.
4 The grey matter forming the floor of the *anterior perforated space* is distinguished by the name of the *anterior perforated plate* or *lamina*.
5 See Appendix, note 368. 6 See Appendix, note 402. 7 Sometimes called the *bulb of the fornix*. 8 See Appendix, note 362.
9 Or *intraventricular portion* (or *nucleus*) *of the corpus striatum*. See note 1 to p. 766.
10 Or *extraventricular portion* (or *nucleus*) *of the corpus striatum*. See note 1 to p. 766.
11 Quain uses the terms *ansa peduncularis* and *lower stalk of the thalamus* as synonymous. Fig. 1219 shows that the two form a continuous strand of fibres.
12 See Appendix, note 403. 13 Formerly called *trabs cerebri*.

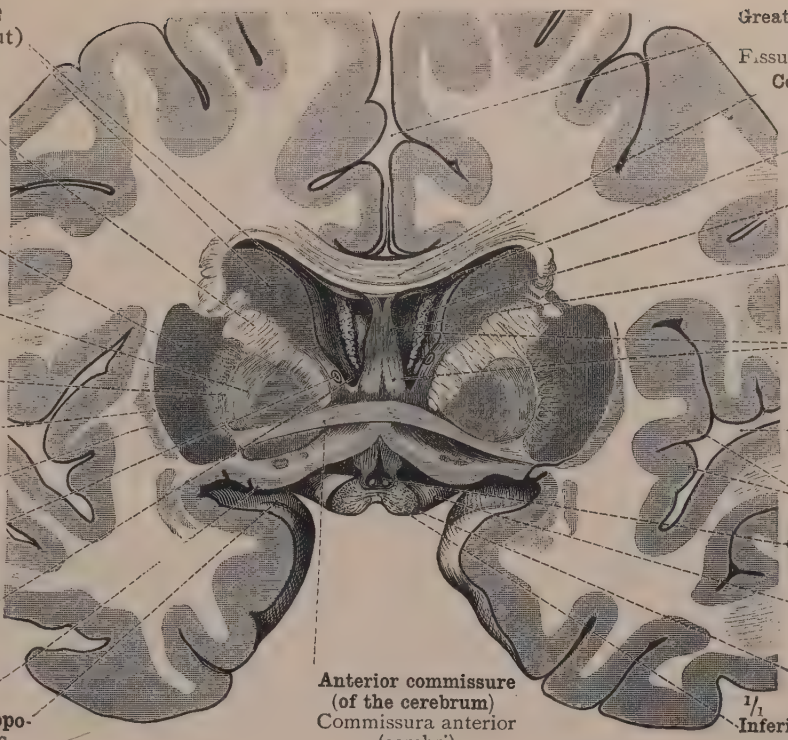

Caudate nucleus[5] (head)
Nucleus caudatus (caput)
Internal capsule (anterior limb)[6]
Capsula interna (pars frontalis)
Lenticular nucleus[10] Putamen
Nucleus lentiformis Globus pallidus
Medullary lamina (of the lenticular nucleus)
Lamina medullaris
External capsule
Capsula externa
Claustrum
Vein of the corpus striatum
Vena terminalis
Foramen of Monro
Foramen interventriculare (Monroi)
Anterior perforated plate or lamina[7]
Substantia perforata anterior
Uncus or hook of the hippocampal gyrus—Uncus
Anterior commissure (of the cerebrum)
Commissura anterior (cerebri)
Great longitudinal fissure of the cerebrum
Fissura longitudinalis cerebri
Corpus callosum, or great commissure[4]
Anterior horn of the lateral ventricle
Cornu anterius ventriculi lateralis
Choroid plexus of the lateral ventricle—Plexus chorioideus ventriculi lateralis
Septum lucidum
Septum pellucidum
Anterior pillar of the fornix, or columna fornicis
Fissure of Sylvius
Fissura cerebri lateralis (Sylvii)
Gyri of the central lobe or island of Reil—Gyri insulæ
Optic recess of the third ventricle—Recessus opticus ventriculi tertii
Optic tract
Tractus opticus
Optic commissure or chiasma (hindmost portion)—Chiasma opticum
Inferior commissure, or commissure of Gudden
Commissura inferior (Guddeni)
1/1

FIG. 1221.—CORONAL SECTION PASSING THROUGH THE OPTIC COMMISSURE OR CHIASMA AND THROUGH THE ANTERIOR COMMISSURE OF THE CEREBRUM. ANTERIOR SURFACE OF POSTERIOR SEGMENT. A VIEW IS OBTAINED INTO THE THIRD VENTRICLE FROM BEFORE.

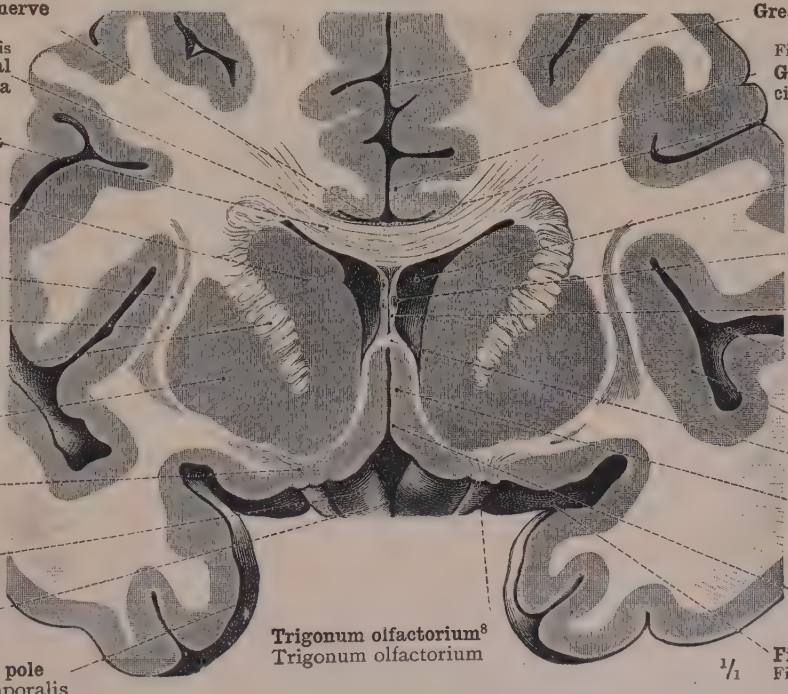
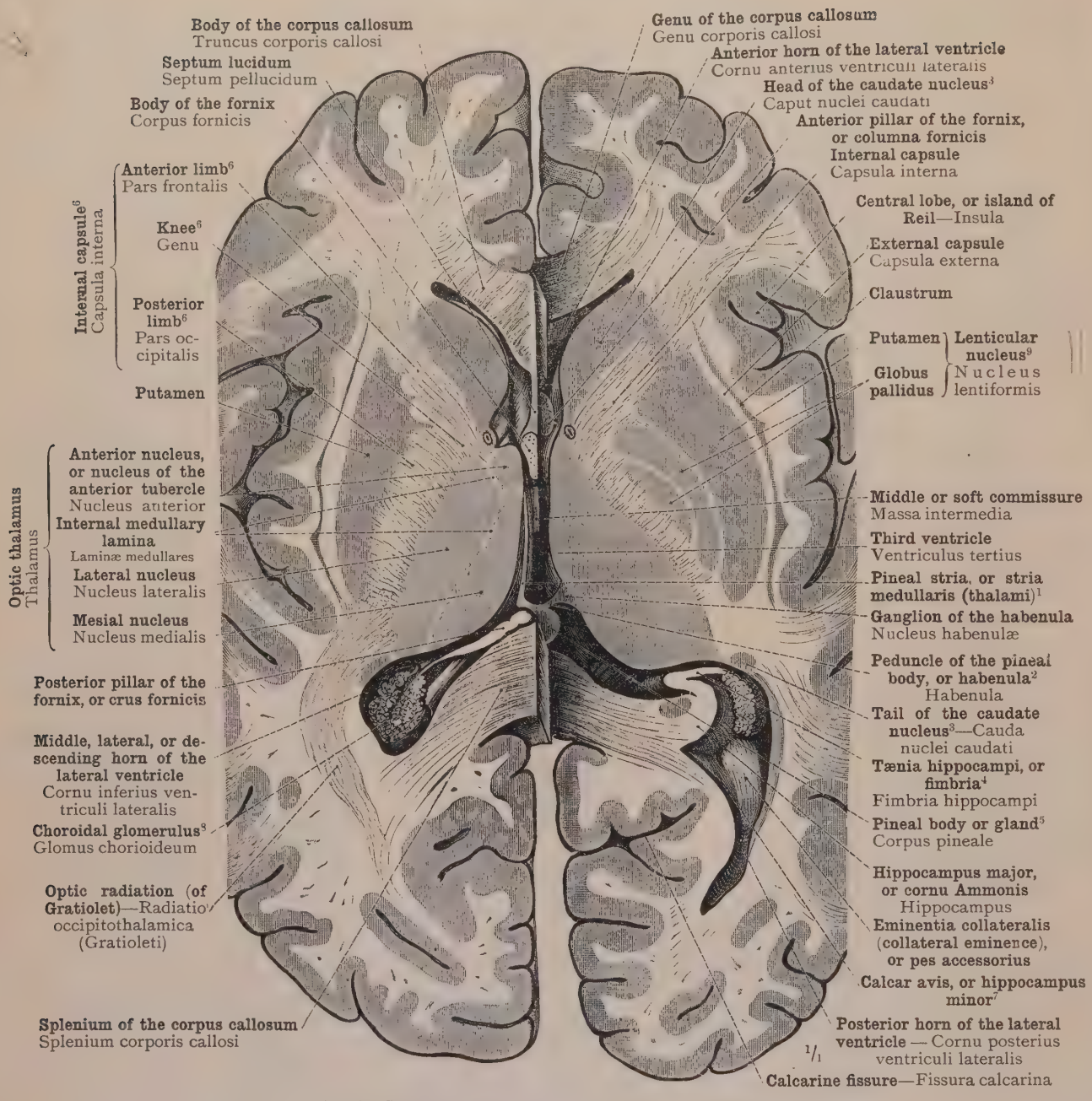


FIG. 1222.—CORONAL SECTION PASSING IN FRONT OF THE ANTERIOR COMMISSURE OF THE CEREBRUM AND THROUGH THE ANTERIOR EXTREMITIES OF THE CAUDATE AND LENTICULAR NUCLEI (*see note* [1] *to p.* 766). POSTERIOR SURFACE OF ANTERIOR SEGMENT. A VIEW IS OBTAINED OF THE ANTERIOR WALLS OF THE ANTERIOR HORNS OF THE LATERAL VENTRICLES.

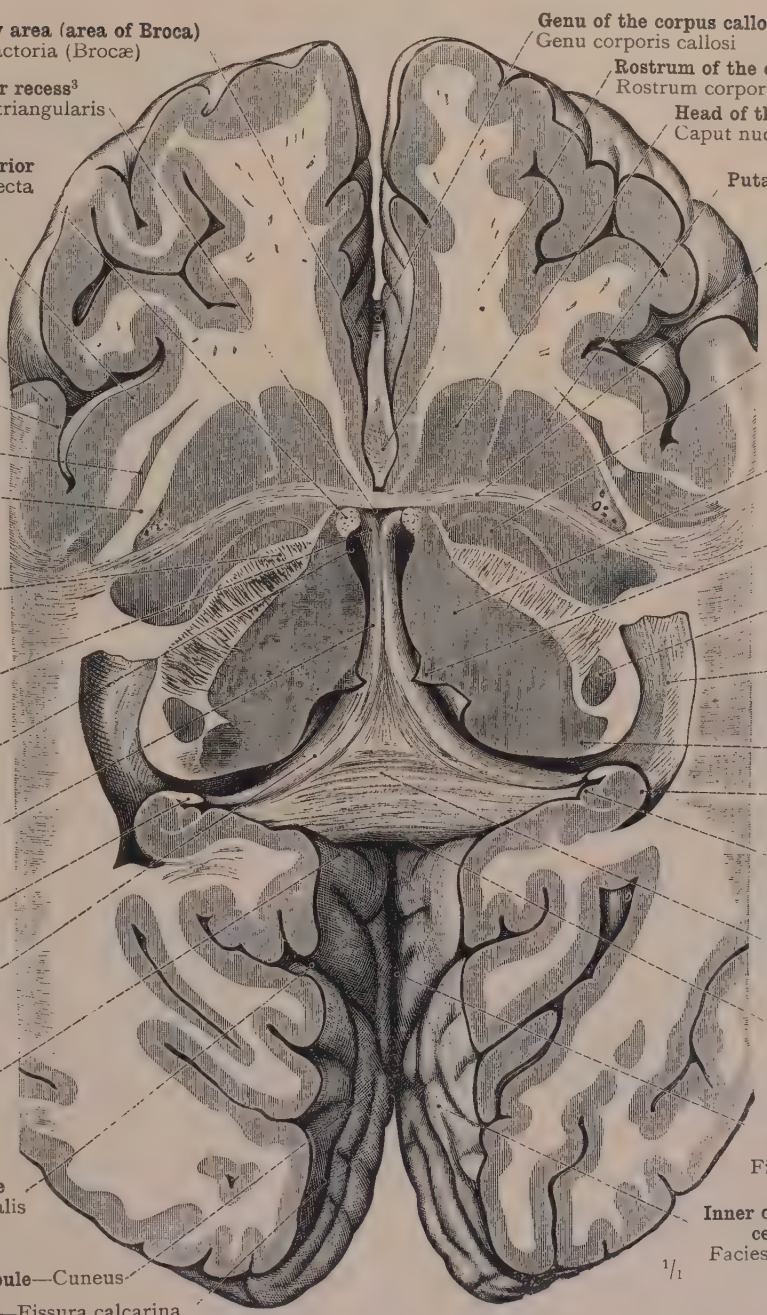
[1] See Appendix, note 390. [2] See Appendix, note 392. [3] See Appendix, note 367. [4] Formerly called *trabs cerebri*.
[5] Also called the *interventricular portion* (or *nucleus*) of the *corpus striatum*. See note [1] to p. 766.
[6] See Appendix, note 404. [7] *I.e.*, the grey matter forming the floor of the *anterior perforated space*.
[8] See Appendix, note 368 [9] See note [1] to p. 766.
[10] Also called the *extraventricular portion* (or *nucleus*) *of the corpus striatum*. See note [1] to p. 766.



1 Also called *tænia fornicis*. See Appendix, notes 379 and 392. 2 See Appendix, note 365.
3 See note 1 to p. 766. 4 Called by Macalister the *corpus fimbriatum*. See Appendix, note 392.
5 Known also as the *conarium* and as the *epiphysis cerebri*. See Appendix, note 375.
6 See Appendix, note 404. 7 Or *ergot* (Morand). 8 See note 3 to p. 781.
9 Also called the *extraventricular portion* (or *nucleus*) *of the corpus striatum*. See note 1 to p. 766.

FIG. 1223.—ON THE RIGHT SIDE OF THE BRAIN THE PLANE OF SECTION IS ABOUT 1·5 CENTIMETRES (0·6 INCH) DEEPER THAN ON THE LEFT SIDE. WHILST, THEREFORE, ON THE LEFT SIDE THE OPTIC THALAMUS AND THE CAUDATE AND LENTICULAR NUCLEI ARE CUT ACROSS NEAR THEIR SUMMITS, ON THE RIGHT SIDE THESE BODIES ARE DIVIDED A LITTLE BELOW THE MIDDLE OF THEIR VERTICAL EXTENT, AND THE DIVISION OF THE LENTICULAR NUCLEUS INTO THREE ZONES IS DISPLAYED. ON THE LEFT SIDE THE COMMON ENTRANCE TO THE POSTERIOR AND MIDDLE (LATERAL OR DESCENDING) HORNS OF THE LATERAL VENTRICLE, WITH THE CHOROIDAL GLOMERULUS (*see note* 3 *to p.* 781), APPEARS IN THE PLANE OF SECTION, WHILST ON THE RIGHT SIDE THE POSTERIOR HORN IS DIVIDED ALONG ITS LONG AXIS, AND THE MIDDLE HORN IS CUT ACROSS OBLIQUELY. ON BOTH SIDES THE INTERNAL CAPSULE OF THE LENTICULAR NUCLEUS, CAPSULA LENTIS INTERNA, IS SEEN IN HORIZONTAL SECTION, ITS KNEE, GENU, AND ITS ANTERIOR AND POSTERIOR LIMBS, PARS FRONTALIS ET PARS OCCIPITALIS, BEING DISPLAYED (*see Appendix, note* 404). THE EXTERNAL CAPSULE OF THE LENTICULAR NUCLEUS, CAPSULA LENTIS EXTERNA, AND THE CLAUSTRUM ARE ALSO SHOWN. SEEN FROM ABOVE.

Horizontal Section through the Cerebrum.



1 See Appendix, note 391. 2 See note 1 to p. 766. 3 See Appendix, note 389.
4 Called by Macalister *corpus fimbriatum*. See Appendix, note 392. 5 See Appendix, note 390.

FIG. 1224.—THE PLANE OF THE SECTION IS THAT OF THE ANTERIOR COMMISSURE OF THE CEREBRUM, AND THE LOWER SURFACE OF THE UPPER SEGMENT IS DEPICTED, AS SEEN FROM BELOW. THE OPTIC THALAMI AND THE CAUDATE AND LENTICULAR NUCLEI ARE CUT ACROSS NEAR THEIR INFERIOR EXTREMITIES; THE LOWER FREE SURFACES OF THE FORNIX AND THE CORPUS CALLOSUM ARE DISPLAYED. THE HIPPOCAMPUS MAJOR OR CORNU AMMONIS IS CUT ACROSS ALMOST TRANSVERSELY NEAR ITS POSTERIOR EXTREMITY; PART OF THE UPPER WALL OF THE POSTERIOR HORN OF THE LATERAL VENTRICLE IS DISPLAYED. THE ANTERIOR COMMISSURE IS SHOWN IN ITS ENTIRE LENGTH, AND IS SEEN AT EITHER SIDE OF THE SECTION TO PASS INTO THE WHITE MATTER OR MEDULLARY CENTRE OF THE TEMPORAL LOBE.

Horizontal Section through the Cerebrum.

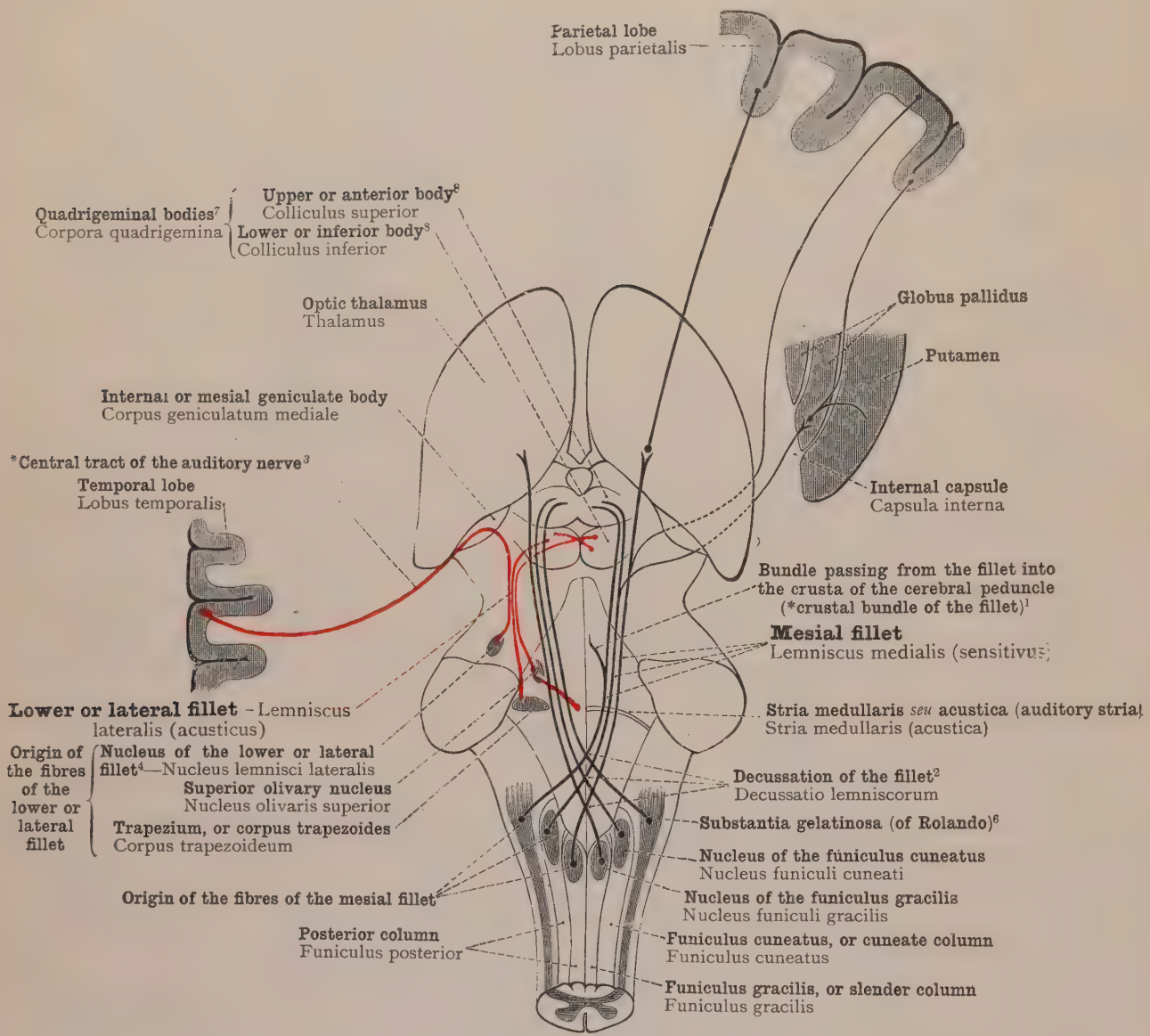


FIG. 1225.—DIAGRAMMATIC REPRESENTATION OF THOSE TRACTS OF THE POSTERIOR COLUMN OF THE SPINAL CORD WHICH REACH THE CEREBRUM WITHOUT PASSING THROUGH THE CEREBELLUM (TRACT OF THE FILLET, OR FILLET PORTION OF THE TEGMENTAL TRACT OR TEGMENTAL SYSTEM[5]). THE COURSE OF THE MESIAL FILLET IS INDICATED BY BLACK LINES, THAT OF THE LOWER OR LATERAL FILLET BY RED LINES.

Regarding the course of the fibres of the cerebral hemisphere, as displayed in Figs. 1225 to 1231, see Appendix, note 406.

1 See Appendix, notes 397 and 405. 2 See Appendix, note 394.

3 **Central Tract of the Auditory Nerve.*—In their account of the fillet, after describing the **triangle of the fillet* (**trigonum lemnisci*—see Appendix, note 369) and the so-called *nucleus of the fillet* (*Schleifenkern*—see Appendix, note 398), Von Langer and Toldt proceed as follows (*op. cit.*, p. 657): "The lateral fillet is reinforced by fibres proceeding from the auditory striæ (striæ medullares *seu* acusticæ) of the opposite side. The indirect upward prolongation of these fibres passes through the brachium of the lower quadrigeminal body into the mesial geniculate body, and thence it is continued to the cortex of the temporal lobe. This is the **central* tract of the auditory nerve" (*centrale Bahn des nervus acusticus*).

4 See Appendix, note 398. 5 See Appendix, note 405. 6 The grey matter of the *funiculus of Rolando*.

7 See note 5 to p. 760. 8 See Appendix, note 372.

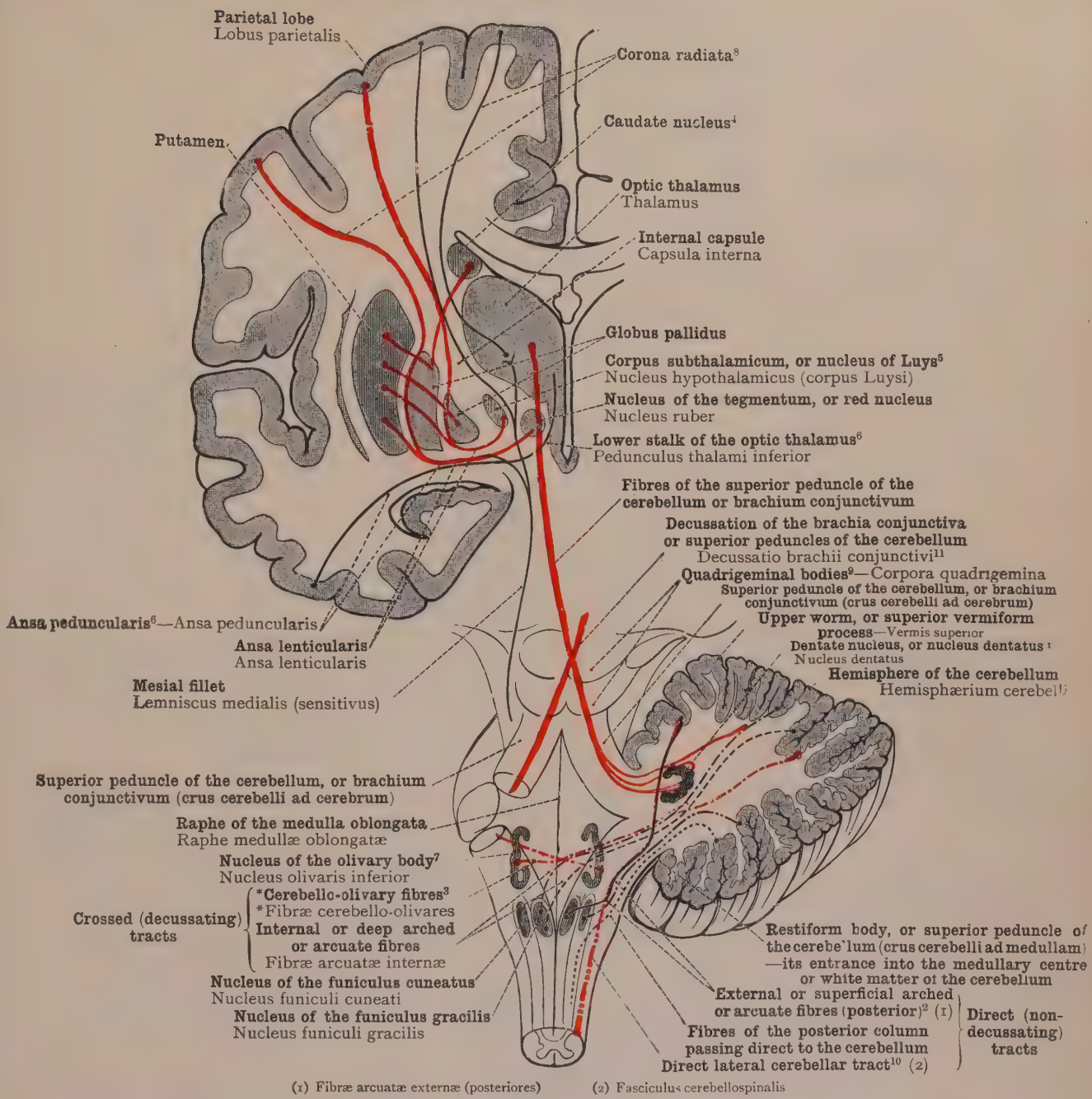
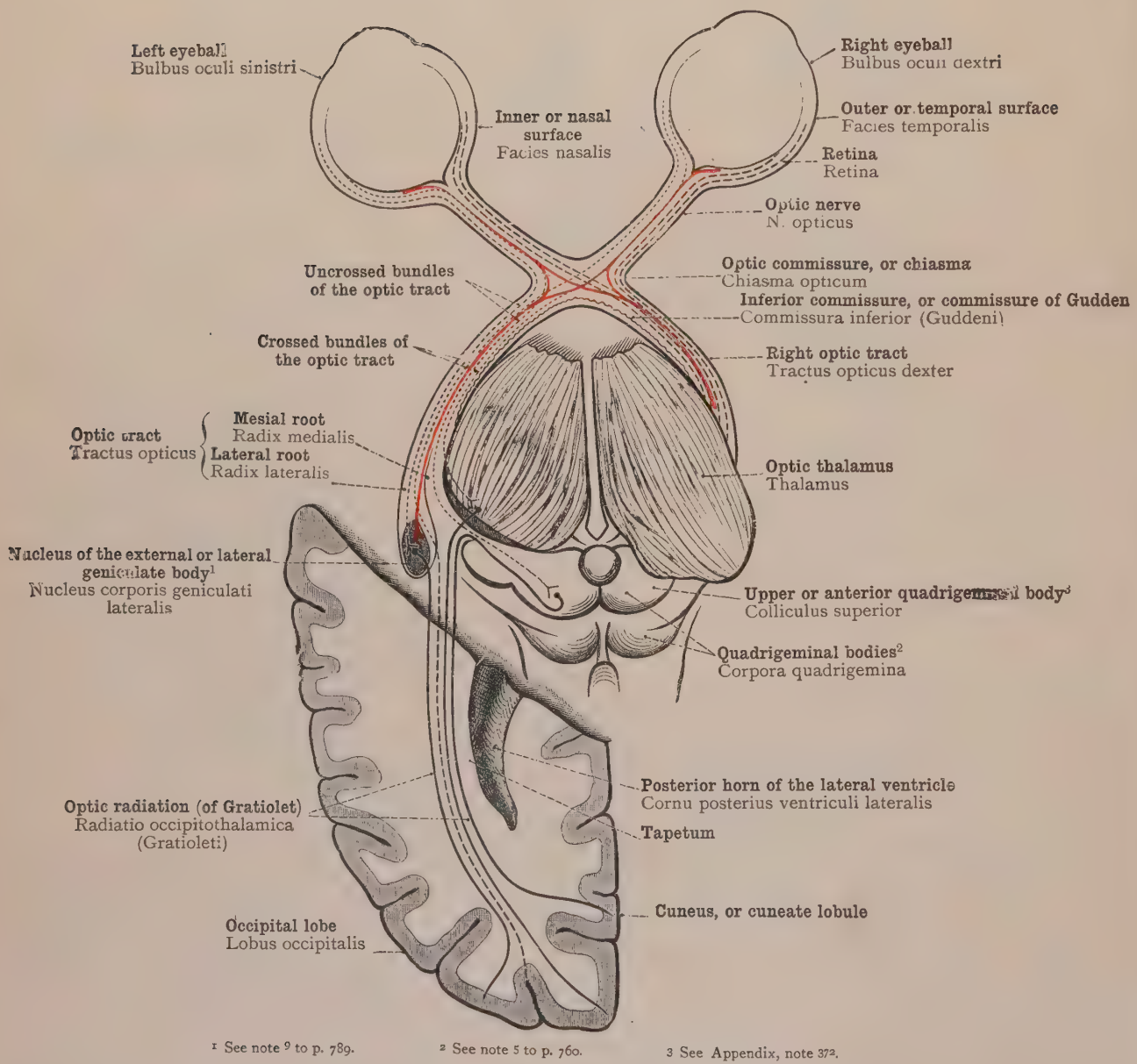

Parietal lobe
Lobus parietalis
Corona radiata[8]
Caudate nucleus[4]
Putamen
Optic thalamus
Thalamus
Internal capsule
Capsula interna
Globus pallidus
Corpus subthalamicum, or nucleus of Luys[5]
Nucleus hypothalamicus (corpus Luysi)
Nucleus of the tegmentum, or red nucleus
Nucleus ruber
Lower stalk of the optic thalamus[6]
Pedunculus thalami inferior
Fibres of the superior peduncle of the cerebellum or brachium conjunctivum
Decussation of the brachia conjunctiva or superior peduncles of the cerebellum
Decussatio brachii conjunctivi[11]
Quadrigeminal bodies[9]—Corpora quadrigemina
Superior peduncle of the cerebellum, or brachium conjunctivum (crus cerebelli ad cerebrum)
Upper worm, or superior vermiform process—Vermis superior
Dentate nucleus, or nucleus dentatus[1]
Nucleus dentatus
Hemisphere of the cerebellum
Hemisphærium cerebelli
Ansa peduncularis[6]—Ansa peduncularis
Ansa lenticularis
Ansa lenticularis
Mesial fillet
Lemniscus medialis (sensitivus)
Superior peduncle of the cerebellum, or brachium conjunctivum (crus cerebelli ad cerebrum)
Raphe of the medulla oblongata
Raphe medullæ oblongatæ
Nucleus of the olivary body[7]
Nucleus olivaris inferior
Crossed (decussating) tracts
*Cerebello-olivary fibres[3]
*Fibræ cerebello-olivares
Internal or deep arched or arcuate fibres
Fibræ arcuatæ internæ
Nucleus of the funiculus cuneatus
Nucleus funiculi cuneati
Nucleus of the funiculus gracilis
Nucleus funiculi gracilis
Restiform body, or superior peduncle of the cerebellum (crus cerebelli ad medullam)—its entrance into the medullary centre or white matter of the cerebellum
External or superficial arched or arcuate fibres (posterior)[2] (1)
Fibres of the posterior column passing direct to the cerebellum
Direct lateral cerebellar tract[10] (2)
Direct (non-decussating) tracts
(1) Fibræ arcuatæ externæ (posteriores)
(2) Fasciculus cerebellospinalis

FIG. 1226.—DIAGRAMMATIC REPRESENTATION OF THOSE TRACTS OF THE POSTERIOR COLUMN OF THE SPINAL CORD WHICH PASS THROUGH THE RESTIFORM BODIES INTO THE CEREBELLUM OR PASS THROUGH THE CEREBELLUM ON THEIR WAY TO THE CEREBRUM (DORSAL OR CEREBELLAR PORTION OF THE TEGMENTAL TRACT—*see Appendix, note* [405]), AND FIBRES PASSING DIRECT FROM THE POSTERIOR COLUMN TO THE CEREBELLUM. THE DIRECT LATERAL CEREBELLAR TRACT.

[1] Known also as the *corpus aentatum* or *corpus ciliare.*
[2] See Appendix, note 393. [3] See Appendix, note 395.
[4] Also known as the *intraventricular portion* (or *nucleus*) *of the corpus striatum.* See note [1] to p. 766.
[5] See Appendix, note 402. [6] See note [11] to p. 792.
[7] Or (*inferior*) *olivary nucleus*; also known as the *corpus dentatum of the olive.* See Appendix, note 385.
[8] Or *fibrous cone* (Mayo). [9] See note [5] to p. 760.
[10] See Appendix, note 344. [11] See note [11] to p. 772.

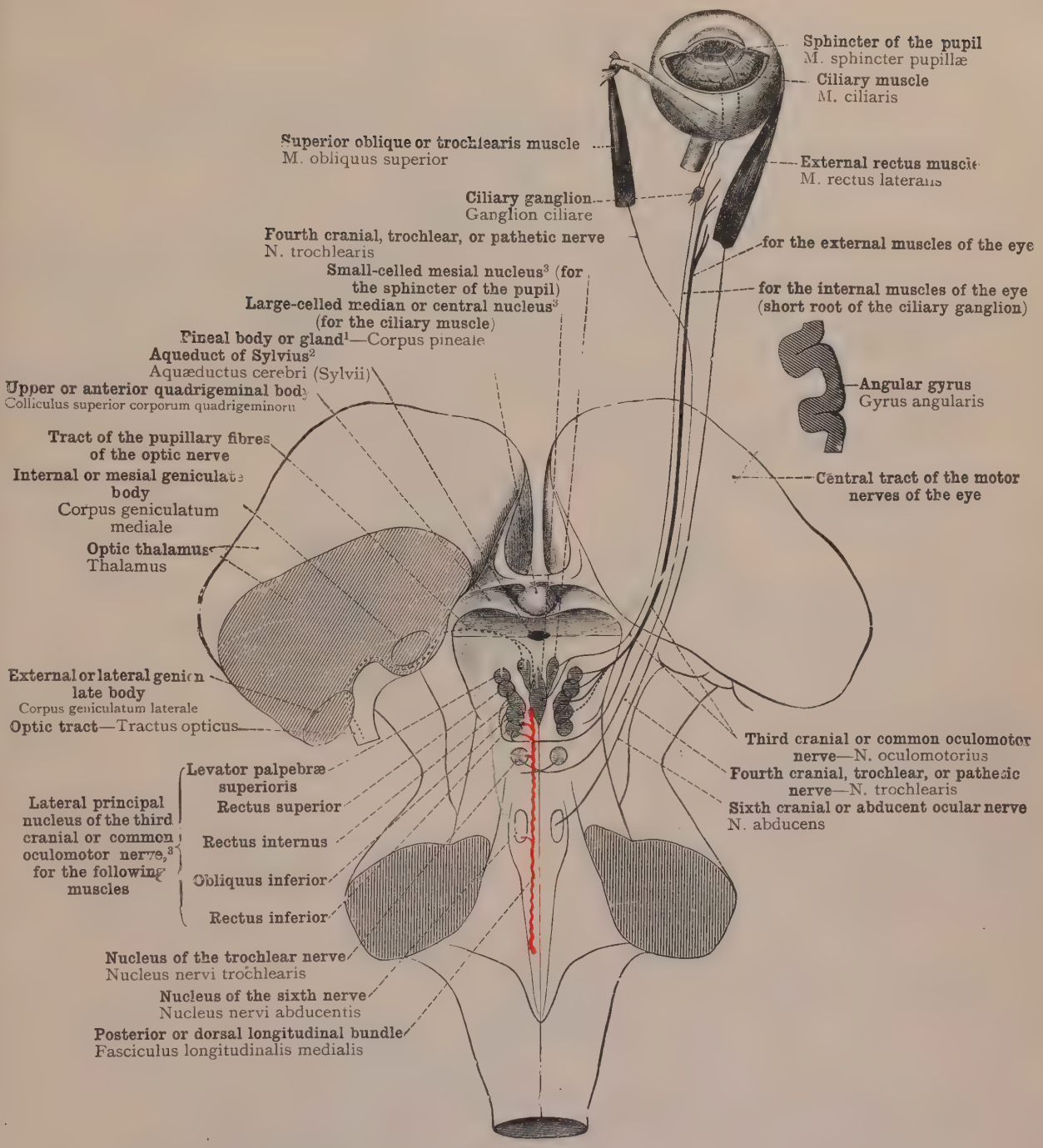
Decursus fibrarum cerebralium—The course of the fibres of the brain.



[1] See note 9 to p. 789. [2] See note 5 to p. 760. [3] See Appendix, note 372.

FIG. 1227.—DIAGRAMMATIC REPRESENTATION OF THE COURSE OF THE FIBRES OF THE OPTIC NERVE THROUGH THE OPTIC COMMISSURE OR CHIASMA, AND OF THE CENTRAL PATHS OF CONDUCTION OF VISUAL IMPULSES. THE FASCICULI PROCEEDING FROM THE MACULA LUTEA, SOME OF WHICH ARE CROSSED AND SOME UNCROSSED, ARE INDICATED BY RED LINES.

Decursus fibrarum cerebralium—The course of the fibres of the brain.

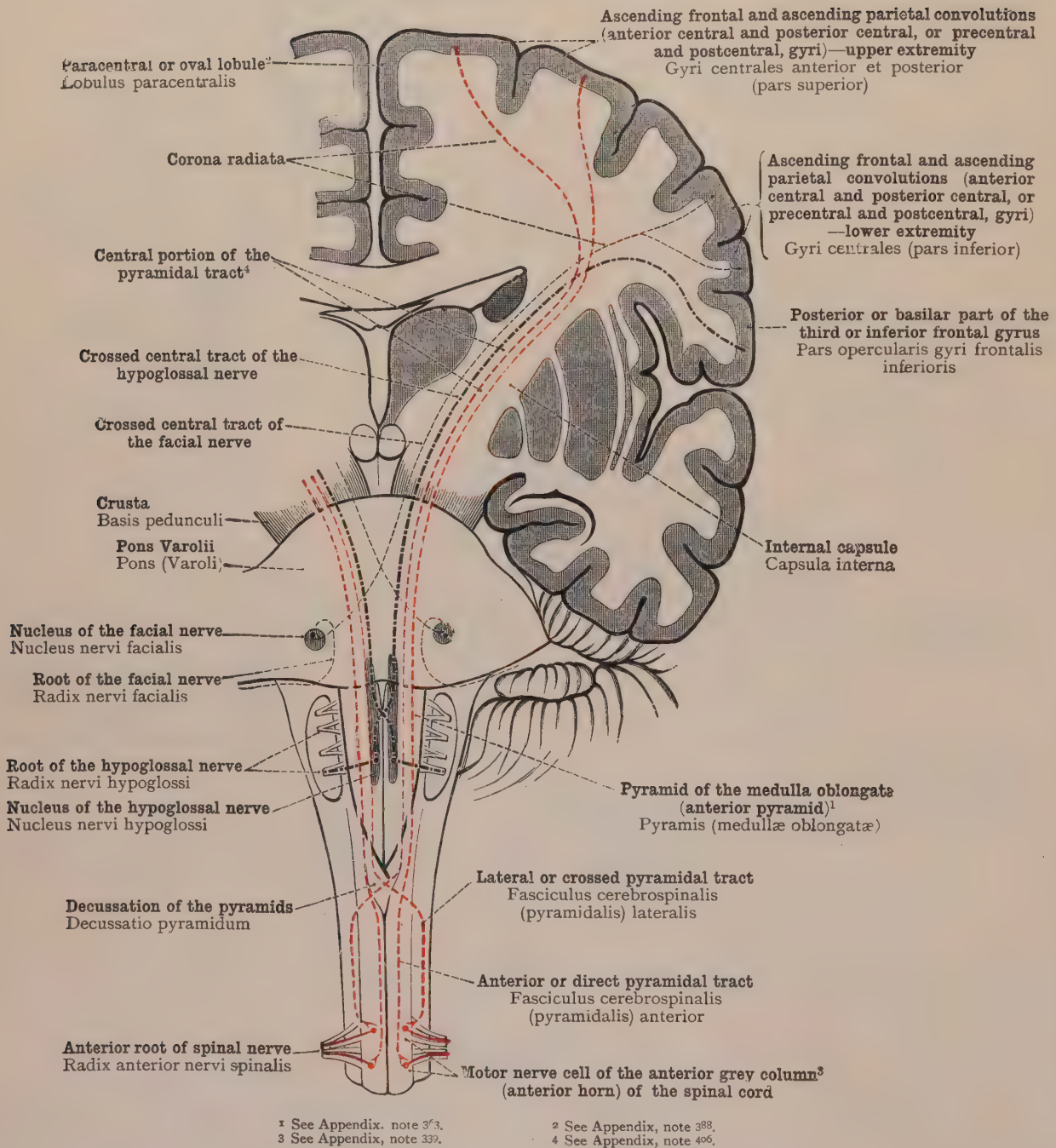

Sphincter of the pupil
M. sphincter pupillæ
Ciliary muscle
M. ciliaris
Superior oblique or trochlearis muscle
M. obliquus superior
External rectus muscle
M. rectus lateralis
Ciliary ganglion
Ganglion ciliare
Fourth cranial, trochlear, or pathetic nerve
N. trochlearis
for the external muscles of the eye
Small-celled mesial nucleus[3] (for the sphincter of the pupil)
Large-celled median or central nucleus[3] (for the ciliary muscle)
for the internal muscles of the eye (short root of the ciliary ganglion)
Pineal body or gland[1]—Corpus pineale
Aqueduct of Sylvius[2]
Aquæductus cerebri (Sylvii)
Upper or anterior quadrigeminal body
Colliculus superior corporum quadrigeminorum
Angular gyrus
Gyrus angularis
Tract of the pupillary fibres of the optic nerve
Internal or mesial geniculate body
Corpus geniculatum mediale
Central tract of the motor nerves of the eye
Optic thalamus
Thalamus
External or lateral geniculate body
Corpus geniculatum laterale
Optic tract—Tractus opticus
Third cranial or common oculomotor nerve—N. oculomotorius
Fourth cranial, trochlear, or pathetic nerve—N. trochlearis
Sixth cranial or abducent ocular nerve
N. abducens
Lateral principal nucleus of the third cranial or common oculomotor nerve,[3] for the following muscles
Levator palpebræ superioris
Rectus superior
Rectus internus
Obliquus inferior
Rectus inferior
Nucleus of the trochlear nerve
Nucleus nervi trochlearis
Nucleus of the sixth nerve
Nucleus nervi abducentis
Posterior or dorsal longitudinal bundle
Fasciculus longitudinalis medialis

1 Known also as the *conarium* and as the *epiphysis cerebri*. See Appendix, note 365. 2 Or *iter a tertio ad quartum ventriculum.*
3 See Appendix, note 407. 4 See Appendix, note 372.

FIG. 1228.—NUCLEI OF ORIGIN OF THE COMMON OCULOMOTOR AND TROCHLEAR NERVES IN THE MID-BRAIN OR MESENCEPHALON; THEIR CENTRAL TRACT (BLUE), THEIR INTERCONNEXIONS EACH WITH THE OTHER (RED), AND THEIR CONNEXIONS WITH THE NUCLEUS OF THE SIXTH CRANIAL OR ABDUCENT OCULAR NERVE THROUGH THE POSTERIOR OR DORSAL LONGITUDINAL BUNDLE (RED). THE DIVISION OF THE NUCLEUS OF THE THIRD CRANIAL OR COMMON OCULOMOTOR NERVE INTO THE LATERAL PRINCIPAL NUCLEUS, THE SMALL-CELLED MESIAL NUCLEUS, AND THE LARGE-CELLED MEDIAN OR CENTRAL NUCLEUS (*see Appendix, note* 407); THE LOCALIZATION OF THE SEVERAL GROUPS OF FIBRES OF THE THIRD NERVE IN THIS NUCLEAR REGION. THE CENTRAL COURSE OF THE SO-CALLED PUPILLARY FIBRES OF THE OPTIC NERVE (REFLEX ARC FOR THE CONTRACTION OF THE PUPIL).

The diagram is based on the researches of Bernheimer.

Decursus fibrarum cerebralium—The course of the fibres of the brain.


Ascending frontal and ascending parietal convolutions (anterior central and posterior central, or precentral and postcentral, gyri)—upper extremity
Gyri centrales anterior et posterior (pars superior)
Paracentral or oval lobule[2]
Lobulus paracentralis
Corona radiata
Ascending frontal and ascending parietal convolutions (anterior central and posterior central, or precentral and postcentral, gyri) —lower extremity
Gyri centrales (pars inferior)
Central portion of the pyramidal tract[4]
Posterior or basilar part of the third or inferior frontal gyrus
Pars opercularis gyri frontalis inferioris
Crossed central tract of the hypoglossal nerve
Crossed central tract of the facial nerve
Crusta
Basis pedunculi
Pons Varolii
Pons (Varoli)
Internal capsule
Capsula interna
Nucleus of the facial nerve
Nucleus nervi facialis
Root of the facial nerve
Radix nervi facialis
Root of the hypoglossal nerve
Radix nervi hypoglossi
Nucleus of the hypoglossal nerve
Nucleus nervi hypoglossi
Pyramid of the medulla oblongata (anterior pyramid)[1]
Pyramis (medullæ oblongatæ)
Lateral or crossed pyramidal tract
Fasciculus cerebrospinalis (pyramidalis) lateralis
Decussation of the pyramids
Decussatio pyramidum
Anterior or direct pyramidal tract
Fasciculus cerebrospinalis (pyramidalis) anterior
Anterior root of spinal nerve
Radix anterior nervi spinalis
Motor nerve cell of the anterior grey column[3] (anterior horn) of the spinal cord

1 See Appendix. note 3[73].
2 See Appendix, note 3[88].
3 See Appendix, note 339.
4 See Appendix, note 4[06].

FIG. 1229.—THE PYRAMIDAL TRACT (RED) AND THE ASSOCIATED CENTRAL TRACTS OF THE HYPOGLOSSAL AND FACIAL NERVES. DIAGRAMMATIC.

Decursus fibrarum cerebralium—The course of the fibres of the brain.

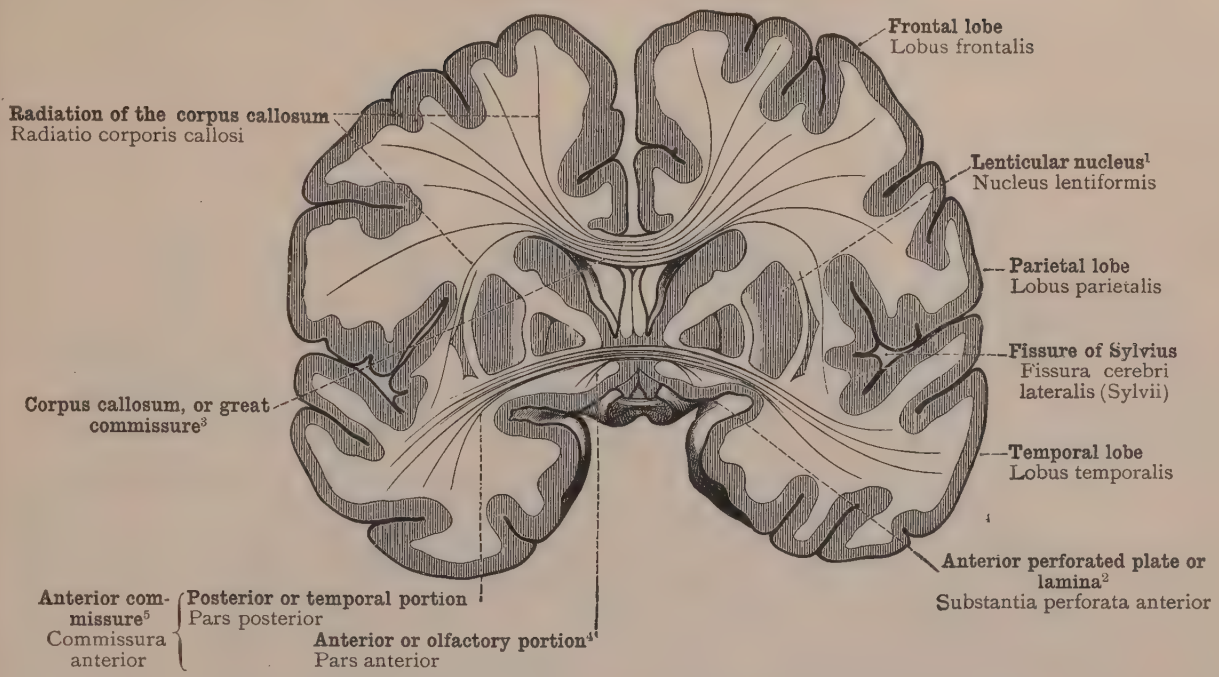


FIG. 1230.—DIAGRAMMATIC REPRESENTATION OF THE TWO PRINCIPAL COMMISSURES OF THE CEREBRUM (*see Appendix, note* [406]): THE CORPUS CALLOSUM OR GREAT COMMISSURE WITH ITS RADIATION; AND THE ANTERIOR COMMISSURE, WITH ITS ANTERIOR OR OLFACTORY PORTION, CONNECTED WITH THE FRONTAL LOBE, AND ITS POSTERIOR OR TEMPORAL PORTION, RADIATING INTO THE TEMPORAL LOBE. (*See Appendix, note* [408].)

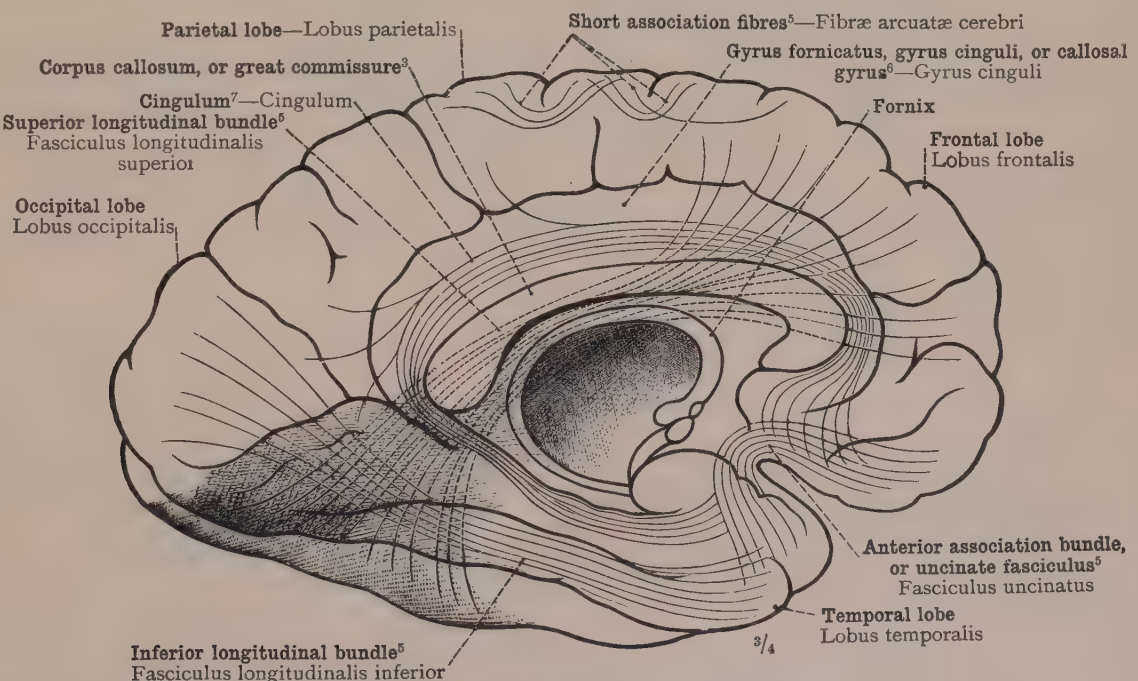
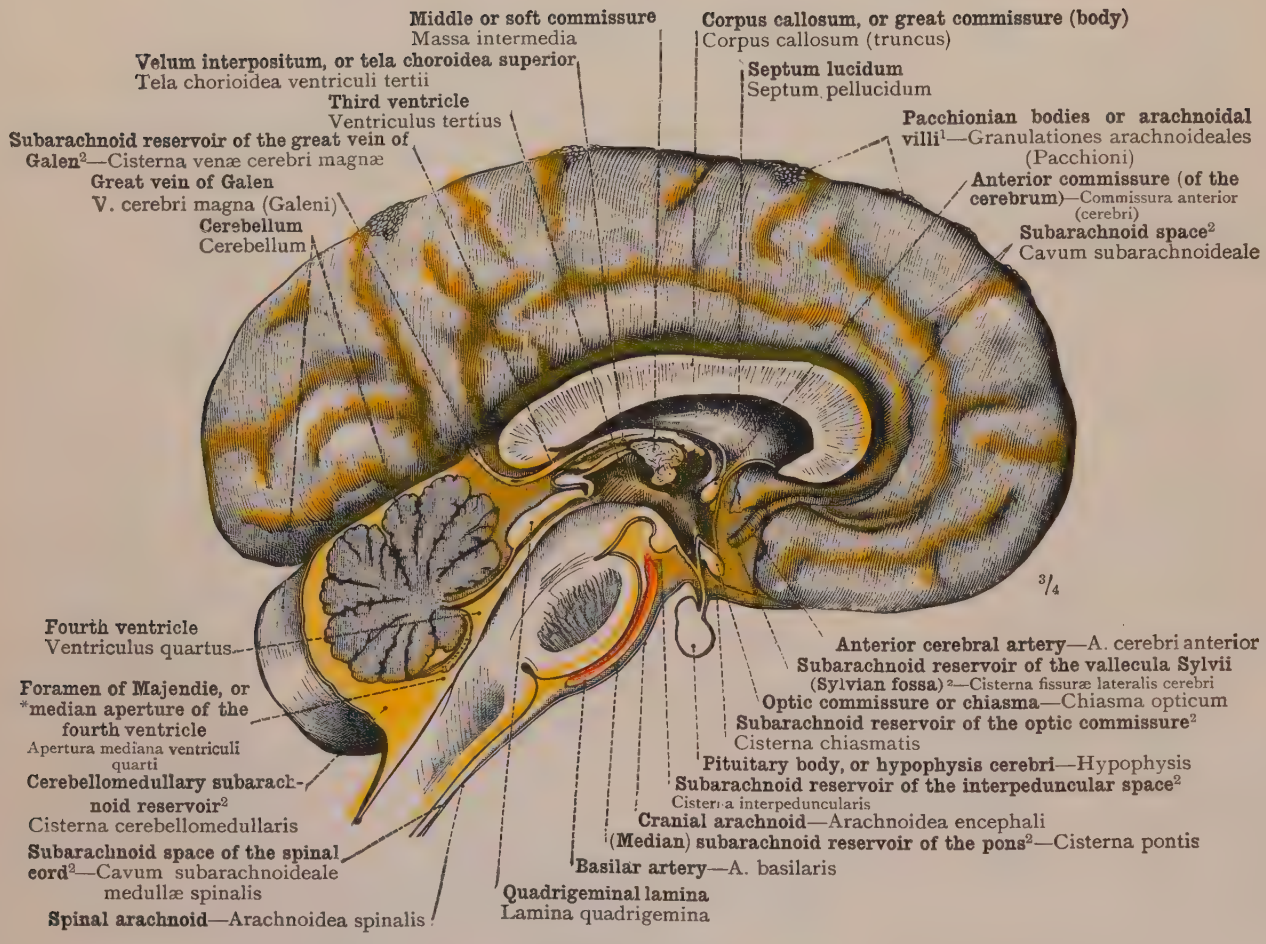


FIG. 1231.—THE PRINCIPAL BUNDLES OF ASSOCIATION FIBRES (*see Appendix, note* [406]) OF THE MEDULLARY CENTRE OF THE CEREBRAL HEMISPHERE, SHOWN IN DIAGRAMMATIC PROJECTION ON THE MESIAL SURFACE OF THE HEMISPHERE.

1 Also known as the *extraventricular portion* (or *nucleus*) *of the corpus striatum*. See note [1] to p. 766.
2 Forming the floor of the *anterior perforated space*. 3 Formerly known as the *trabs cerebri*. See Appendix, note [406].
4 See Appendix, note [408]. 5 See Appendix, note [405]. 6 See Appendix, note [390].
7 Also known as the *fillet of the corpus callosum* and as the *covered band of Reil*. See Appendix, note [406].

Decursus fibrarum cerebralium—The course of the fibres of the brain.


Middle or soft commissure
Massa intermedia
Corpus callosum, or great commissure (body)
Corpus callosum (truncus)
Velum interpositum, or tela choroidea superior
Tela chorioidea ventriculi tertii
Septum lucidum
Septum pellucidum
Third ventricle
Ventriculus tertius
Pacchionian bodies or arachnoidal villi[1]—Granulationes arachnoideales (Pacchioni)
Subarachnoid reservoir of the great vein of Galen[2]—Cisterna venæ cerebri magnæ
Great vein of Galen
V. cerebri magna (Galeni)
Anterior commissure (of the cerebrum)—Commissura anterior (cerebri)
Cerebellum
Cerebellum
Subarachnoid space[2]
Cavum subarachnoideale
3/4
Fourth ventricle
Ventriculus quartus
Anterior cerebral artery—A. cerebri anterior
Subarachnoid reservoir of the vallecula Sylvii (Sylvian fossa)[2]—Cisterna fissuræ lateralis cerebri
Foramen of Majendie, or *median aperture of the fourth ventricle
Apertura mediana ventriculi quarti
Optic commissure or chiasma—Chiasma opticum
Subarachnoid reservoir of the optic commissure[2]
Cisterna chiasmatis
Pituitary body, or hypophysis cerebri—Hypophysis
Cerebellomedullary subarachnoid reservoir[2]
Cisterna cerebellomedullaris
Subarachnoid reservoir of the interpeduncular space[2]
Cisterna interpeduncularis
Cranial arachnoid—Arachnoidea encephali
(Median) subarachnoid reservoir of the pons[2]—Cisterna pontis
Subarachnoid space of the spinal cord[2]—Cavum subarachnoideale medullæ spinalis
Basilar artery—A. basilaris
Quadrigeminal lamina
Lamina quadrigemina
Spinal arachnoid—Arachnoidea spinalis

[1] Known also as *Pacchionian glands* or *Pacchionian granulations.*

[2] See Appendix, note 409.

FIG. 1232.—THE CRANIAL ARACHNOID, ARACHNOIDEA ENCEPHALI, AND THE SUBARACHNOID SPACE, CAVUM SUBARACHNOIDEALE, WITH ITS VARIOUS SUBDIVISIONS AND RESERVOIRS, AS SEEN IN A MEDIAN SAGITTAL SECTION OF THE BRAIN. THE PACCHIONIAN BODIES OR ARACHNOIDAL VILLI, GRANULATIONES ARACHNOIDEALES (*see note* [1] *above*).

The subarachnoid space has been filled with coloured gelatine, and appears in some places somewhat more distended than in the normal condition.

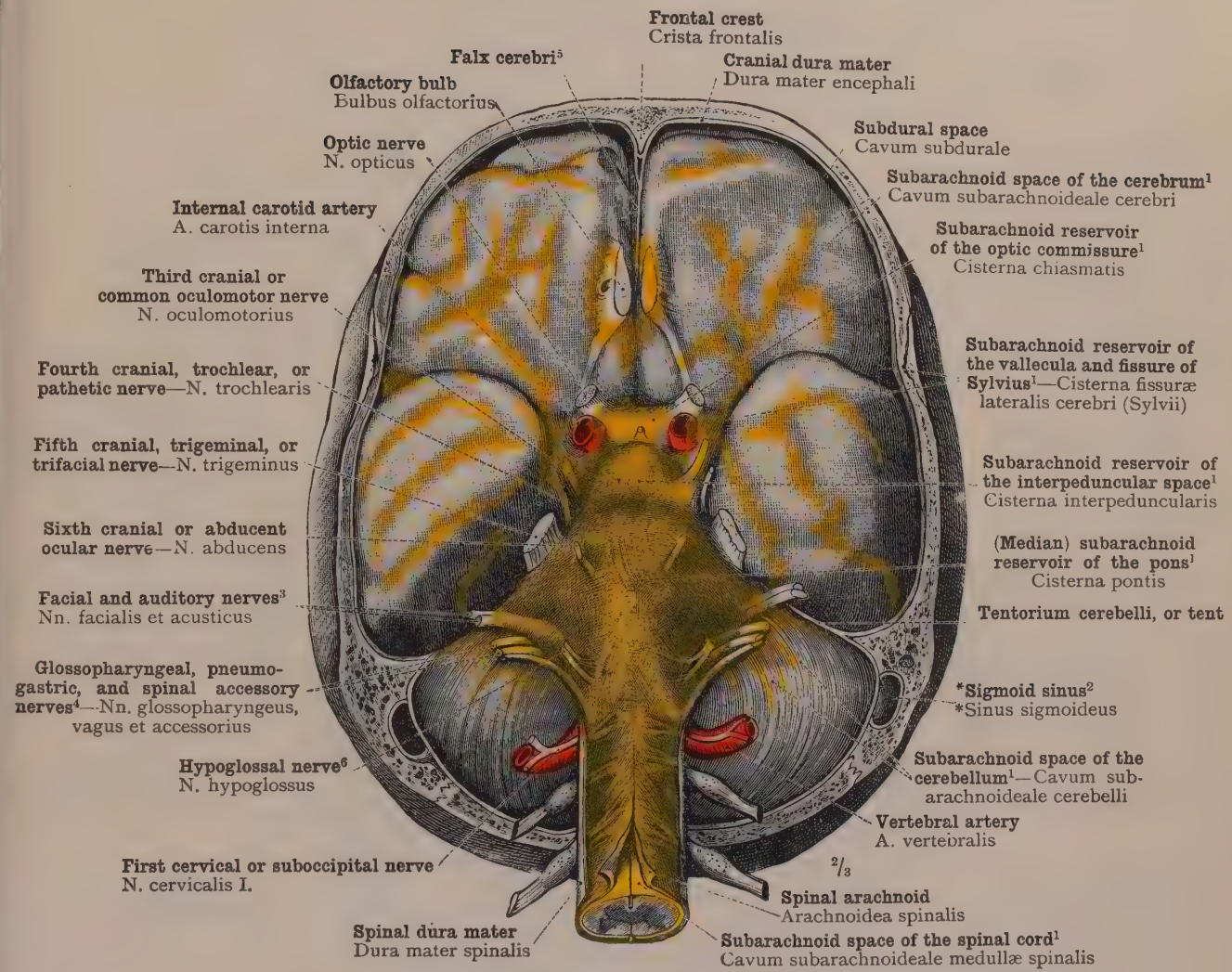


FIG. 1233.—THE CRANIAL ARACHNOID, ARACHNOIDEA ENCEPHALI; FORM AND EXTENT OF THE SUBARACHNOID SPACE, CAVUM SUBARACHNOIDEALE (WHICH HAS BEEN INJECTED WITH GELATINE), ON THE BASAL ASPECT OF THE BRAIN, AND, MORE ESPECIALLY, THE RELATIONS OF THIS SPACE TO THE ROOTS OF THE CRANIAL NERVES.

The gelatine was injected before the head was opened, and the head was then hardened entire in formalin solution. Subsequently the base of the skull and the cervical vertebræ were carefully removed with saw and chisel and the dura mater was dissected off. In the region of the spinal cord the arachnoid was divided for a short distance by a median incision, and the subarachnoid space of the spinal cord was thus opened. Between the arachnoid and the dura mater where that membrane has been preserved in apposition with the calvaria, the subdural space of the brain is visible.

1 See Appendix, note 409. 2 See Appendix, note 410.

3 The *facial nerve* is the *seventh cranial nerve* in Soemmerring's enumeration; the *portio dura of the seventh* in that of Willis. The *auditory nerve* is the *eighth cranial nerve* in Soemmerring's enumeration; the *portio mollis of the seventh* in that of Willis.

4 The *glossopharyngeal* is the *ninth*, the *pneumogastric* or *vagus* the *tenth*, and the *spinal accessory* the *eleventh cranial nerve* in Soemmerring's enumeration; they are respectively the *first*, *second*, and *third trunks of the eighth cranial nerve* in that of Willis.

5 Sometimes called the *falx major*.

6 *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; known also as the *lingual motor nerve*.

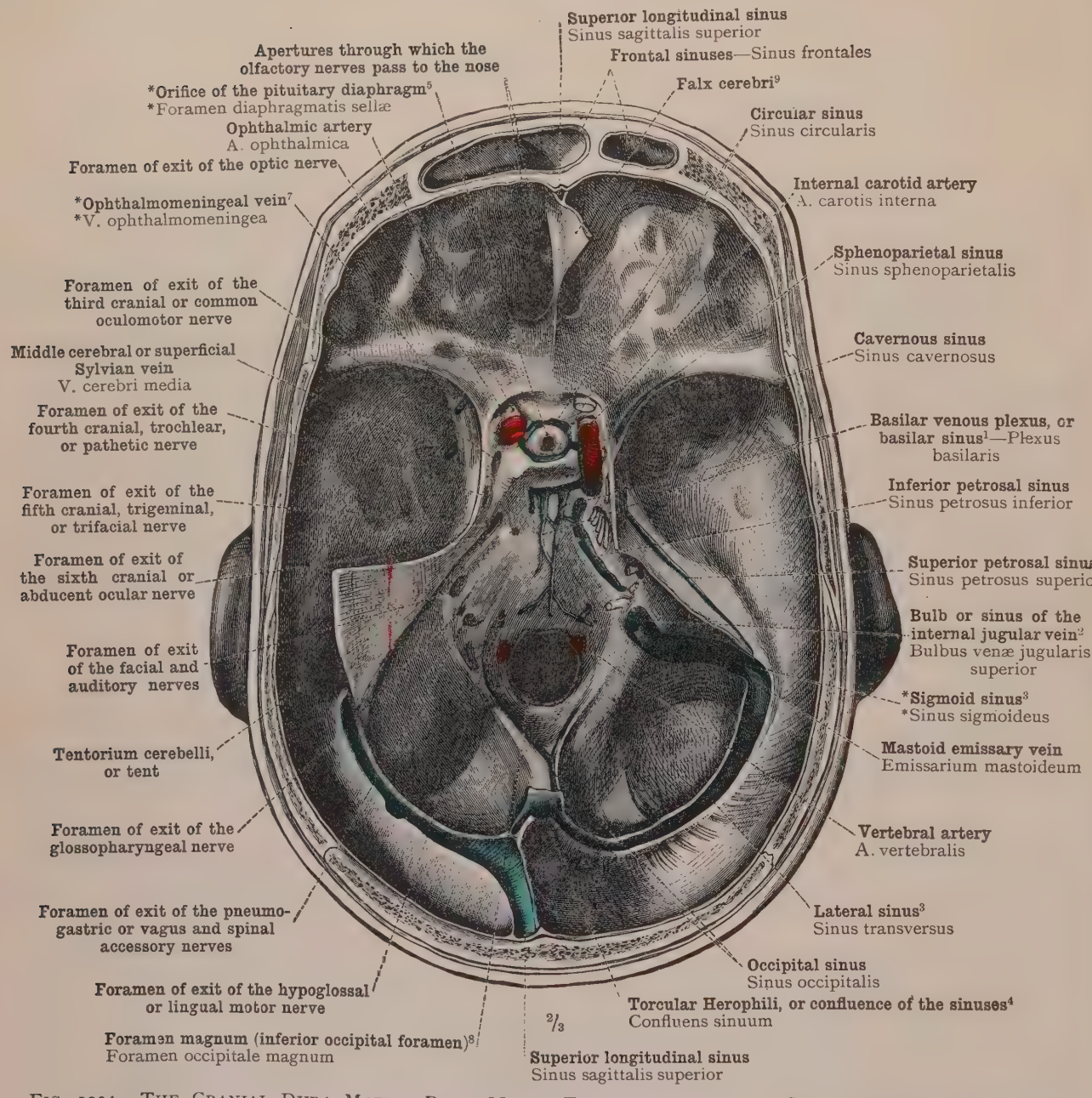

Superior longitudinal sinus
Sinus sagittalis superior
Apertures through which the olfactory nerves pass to the nose
Frontal sinuses—Sinus frontales
*Orifice of the pituitary diaphragm[5]
*Foramen diaphragmatis sellæ
Falx cerebri[9]
Ophthalmic artery
A. ophthalmica
Circular sinus
Sinus circularis
Foramen of exit of the optic nerve
Internal carotid artery
A. carotis interna
*Ophthalmomeningeal vein[7]
*V. ophthalmomeningea
Sphenoparietal sinus
Sinus sphenoparietalis
Foramen of exit of the third cranial or common oculomotor nerve
Cavernous sinus
Sinus cavernosus
Middle cerebral or superficial Sylvian vein
V. cerebri media
Basilar venous plexus, or basilar sinus[1]—Plexus basilaris
Foramen of exit of the fourth cranial, trochlear, or pathetic nerve
Inferior petrosal sinus
Sinus petrosus inferior
Foramen of exit of the fifth cranial, trigeminal, or trifacial nerve
Superior petrosal sinus
Sinus petrosus superior
Foramen of exit of the sixth cranial or abducent ocular nerve
Bulb or sinus of the internal jugular vein[2]
Bulbus venæ jugularis superior
Foramen of exit of the facial and auditory nerves
*Sigmoid sinus[3]
*Sinus sigmoideus
Tentorium cerebelli, or tent
Mastoid emissary vein
Emissarium mastoideum
Foramen of exit of the glossopharyngeal nerve
Vertebral artery
A. vertebralis
Foramen of exit of the pneumogastric or vagus and spinal accessory nerves
Lateral sinus[3]
Sinus transversus
Occipital sinus
Sinus occipitalis
Foramen of exit of the hypoglossal or lingual motor nerve
Torcular Herophili, or confluence of the sinuses[4]
Confluens sinuum
2/3
Foramen magnum (inferior occipital foramen)[8]
Foramen occipitale magnum
Superior longitudinal sinus
Sinus sagittalis superior

FIG. 1234.—THE CRANIAL DURA MATER, DURA MATER ENCEPHALI, WITH THE SINUSES OF THE DURA MATER (VENOUS SINUSES OF THE CRANIUM, MENINGEAL SINUSES), SINUS DURÆ MATRIS, ON THE INTERNAL SURFACE OF THE BASE OF THE SKULL. ON THE LEFT SIDE THE FORAMINA OF EXIT[6] OF THE CRANIAL NERVES THROUGH THE DURA MATER ARE DISPLAYED; ON THE RIGHT SIDE THE ROOTS OF THESE NERVES ARE DISPLAYED AS THEY ARE ABOUT TO PERFORATE THE DURA MATER.

The tentorium cerebelli, or tent, has for the most part been removed; only on the left side has a small portion of this structure been preserved, and this remnant has been turned forwards along its line of attachment to the superior border (or angle) of the petrous portion of the temporal bone. Most of the sinuses have been opened.

[1] Sometimes known as the *transverse sinus*. The *basilar venous plexus* must be carefully distinguished from the *basilar* or *basal vein*, *vena basalis Rosenthali* (shown in Fig. 1202, p. 784). See Appendix to Part V., notes 290 and 297.
[2] See Appendix to Part V., note 121. [3] See Appendix, note 410.
[4] See Appendix to Part V., note 266. [5] See Appendix, note 411.
[6] *Foramina of Exit.*—The term *foramen of exit* is employed as the most suitable English equivalent of the German *Austrittsöffnung* or *Durchtrittsöffnung*. The words "*through the dura mater*" are to be understood when not expressed.
[7] **Ophthalmomeningeal Vein.*—The vein thus named by the author is a communicating branch between the *superior ophthalmic vein* and the *middle cerebral* or *superficial Sylvian vein*.
[8] See Appendix, note 412. [9] Sometimes called the *falx major*.

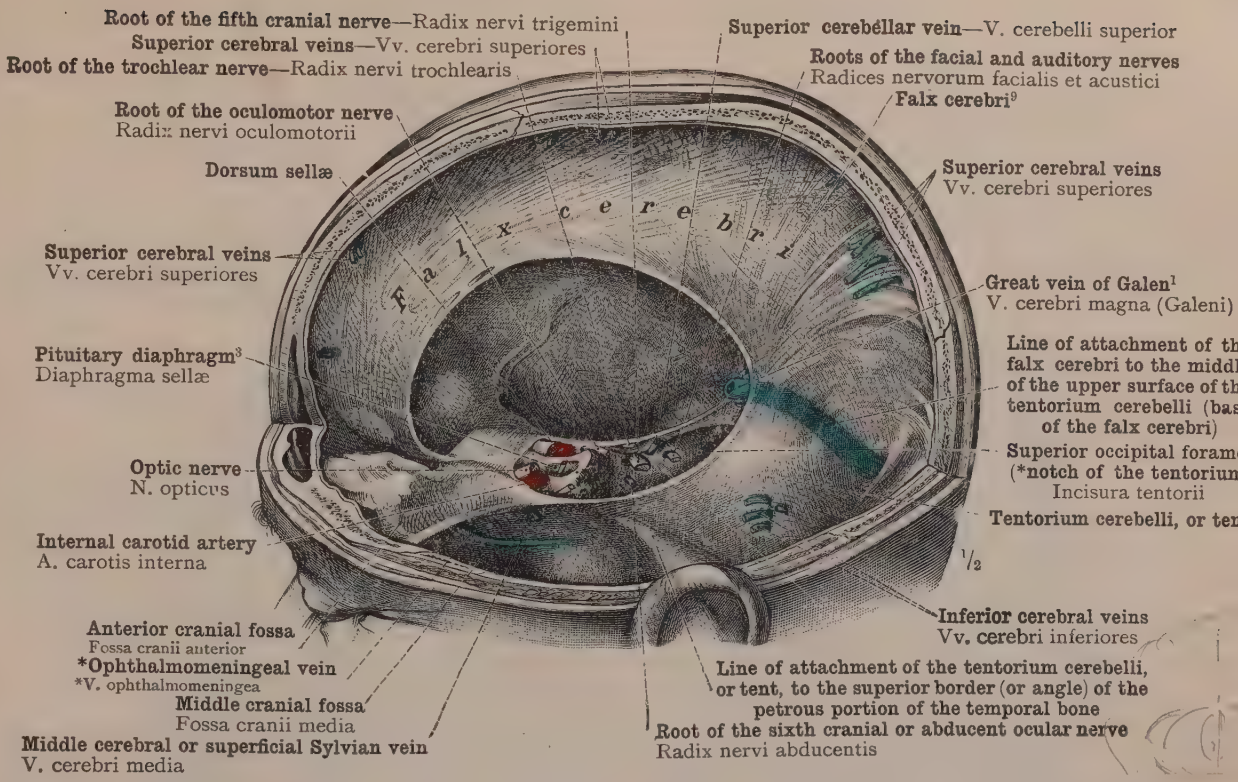

Root of the fifth cranial nerve—Radix nervi trigemini
Superior cerebral veins—Vv. cerebri superiores
Root of the trochlear nerve—Radix nervi trochlearis
Root of the oculomotor nerve
Radix nervi oculomotorii
Dorsum sellæ
Superior cerebral veins
Vv. cerebri superiores
Pituitary diaphragm[3]
Diaphragma sellæ
Optic nerve
N. opticus
Internal carotid artery
A. carotis interna
Anterior cranial fossa
Fossa cranii anterior
*Ophthalmomeningeal vein
*V. ophthalmomeningea
Middle cranial fossa
Fossa cranii media
Middle cerebral or superficial Sylvian vein
V. cerebri media
Superior cerebellar vein—V. cerebelli superior
Roots of the facial and auditory nerves
Radices nervorum facialis et acustici
Falx cerebri[9]
Falx cerebri
Superior cerebral veins
Vv. cerebri superiores
Great vein of Galen[1]
V. cerebri magna (Galeni)
Line of attachment of the falx cerebri to the middle of the upper surface of the tentorium cerebelli (base of the falx cerebri)
Superior occipital foramen
(*notch of the tentorium)[2]
Incisura tentorii
Tentorium cerebelli, or tent
1/2
Inferior cerebral veins
Vv. cerebri inferiores
Line of attachment of the tentorium cerebelli, or tent, to the superior border (or angle) of the petrous portion of the temporal bone
Root of the sixth cranial or abducent ocular nerve
Radix nervi abducentis

FIG. 1235.—THE FALX CEREBRI AND THE TENTORIUM CEREBELLI, OR TENT, SEEN FROM THE LEFT SIDE. THE TRUNKS OF THE CEREBRAL VEINS THAT OPEN INTO THE VENOUS SINUSES OF THE CRANIUM.

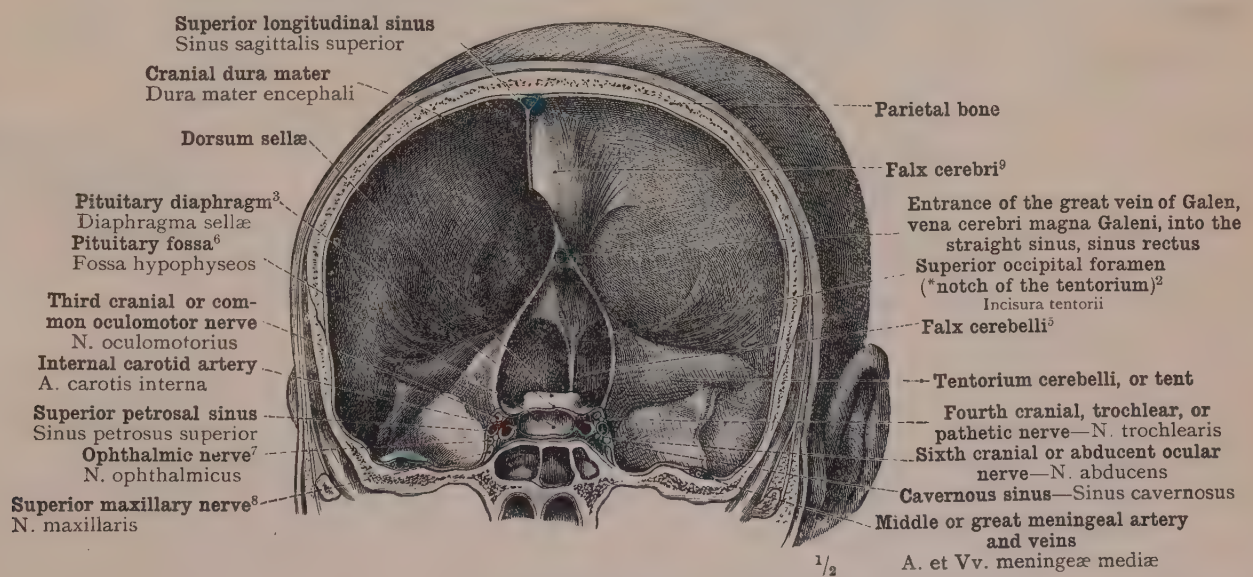


FIG. 1236.—THE TENTORIUM CEREBELLI, OR TENT, THE POSTERIOR PORTION OF THE FALX CEREBRI (FALX MAJOR), AND THE FALX CEREBELLI (FALX MINOR), AS SEEN FROM BEFORE IN A CORONAL SECTION OF THE HEAD. THE SECTION PASSES THROUGH THE PITUITARY FOSSA (*see note [2] to p. 60, in Part I.*) AND THE CAVERNOUS SINUSES IMMEDIATELY BEHIND THE PITUITARY BODY OR HYPOPHYSIS CEREBRI; IN ADDITION, THEREFORE, TO THE STRUCTURES JUST MENTIONED, THE FOLLOWING ARE ALSO DISPLAYED: WITHIN THE CAVITY OF THE CAVERNOUS SINUS, THE INTERNAL CAROTID ARTERY AND THE SIXTH CRANIAL OR ABDUCENT OCULAR NERVE; AND IN THE OUTER WALL OF THE CAVERNOUS SINUS, THE THIRD CRANIAL OR COMMON OCULOMOTOR NERVE, THE FOURTH CRANIAL, PATHETIC, OR TROCHLEAR NERVE, THE OPHTHALMIC NERVE (FIRST DIVISION OF THE FIFTH), AND THE SUPERIOR MAXILLARY NERVE (SECOND DIVISION OF THE FIFTH CRANIAL NERVE).

1 Continued posteriorly into the *straight sinus*, which is visible in Fig. 1235 through the dura mater along the base of the falx cerebri.
2 See Appendix, note 412. 3 By Quain called the *operculum* or *tentorium of the hypophysis*. See Appendix, note 411.
4 See note 7 to p. 804. 5 Sometimes called the *falx minor*. 6 See note 2 to p. 60, in Part I.
7 Or *first division of the fifth cranial, trigeminal*, or *trifacial nerve*.
8 Or *second division of the fifth cranial, trigeminal*, or *trifacial nerve*. 9 Sometimes called the *falx major*.

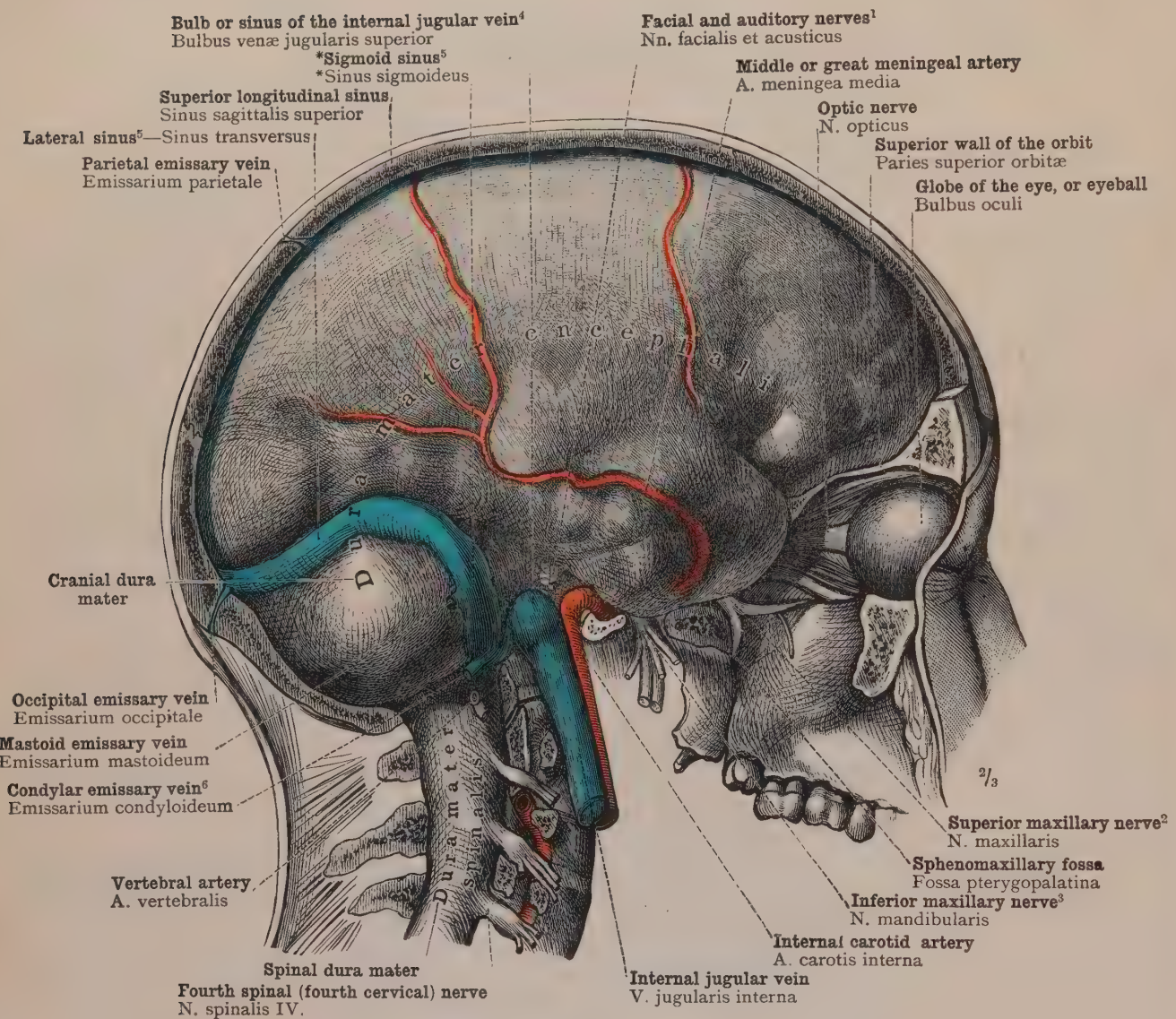


FIG. 1237.—THE CRANIAL DURA MATER, DURA MATER ENCEPHALI, DISPLAYED FROM THE SIDE IN CONTINUITY WITH THE SPINAL DURA MATER, DURA MATER SPINALIS, BY THE REMOVAL OF THE RIGHT HALF OF THE SKULL AND OF THE UPPER CERVICAL VERTEBRÆ. THE SINUSES OF THE DURA MATER (VENOUS SINUSES OF THE CRANIUM, MENINGEAL SINUSES), SINUS DURÆ MATRIS, AND ALSO THE EMISSARY VEINS (EMISSARIA SANTORINI) THAT CONNECT THESE SINUSES WITH THE VEINS OF THE EXTERIOR OF THE SKULL, WERE INJECTED WITH RESIN BY WAY OF THE INTERNAL JUGULAR VEIN.

[1] The *facial nerve* is the *seventh cranial nerve* in Soemmerring's enumeration, the *portio dura of the seventh* in that of Willis; the *auditory nerve* is the *eighth cranial nerve* in Soemmerring's enumeration, the *portio mollis of the seventh* in that of Willis.
[2] Or *second division* of the *fifth cranial, trigeminal,* or *trifacial nerve.*
[3] Or *third division* of the *fifth cranial, trigeminal,* or *trifacial nerve.*
[4] See Appendix to Part V., note 121. [5] See Appendix, note 410. [6] See Appendix to Part V., note 263.

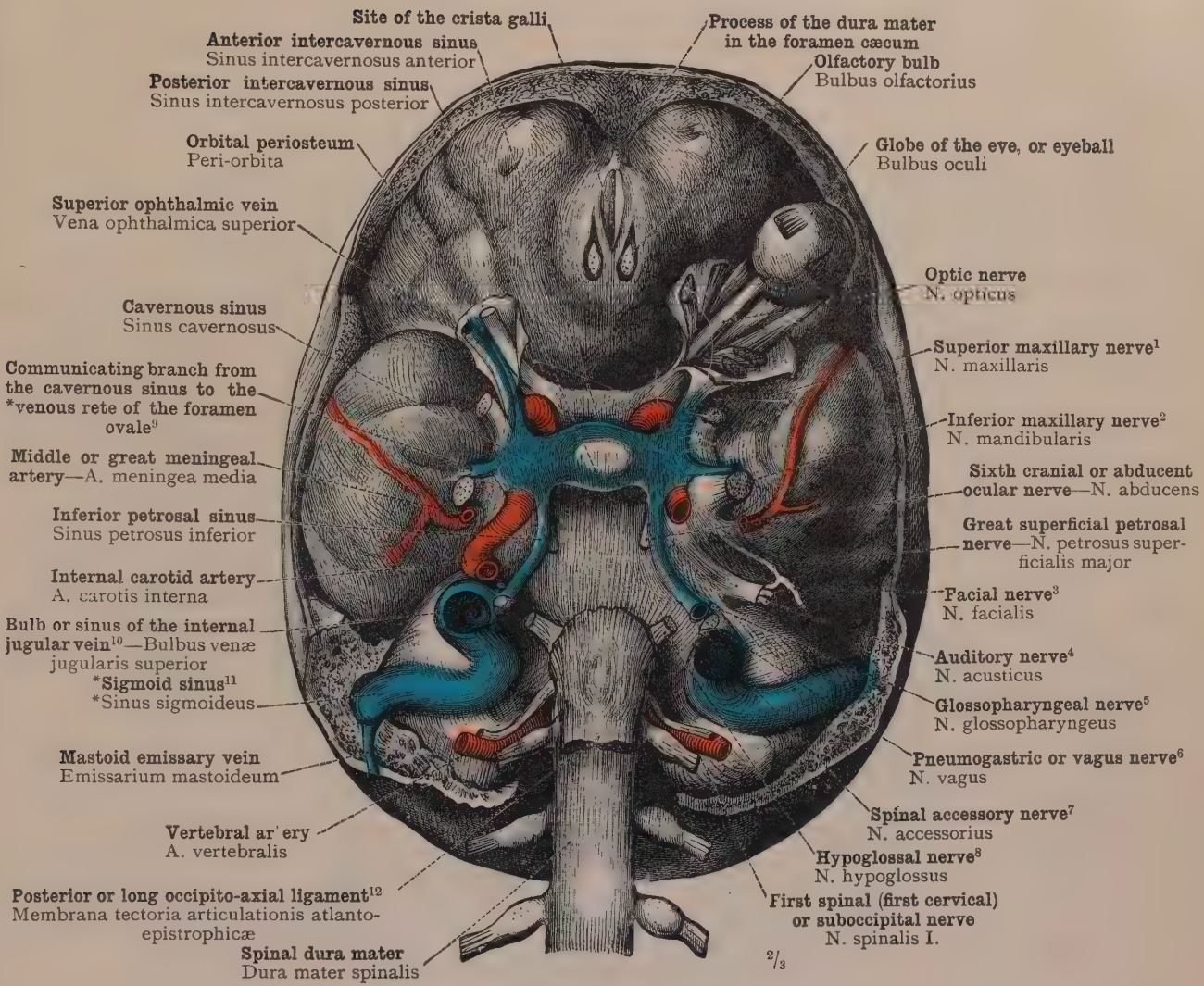
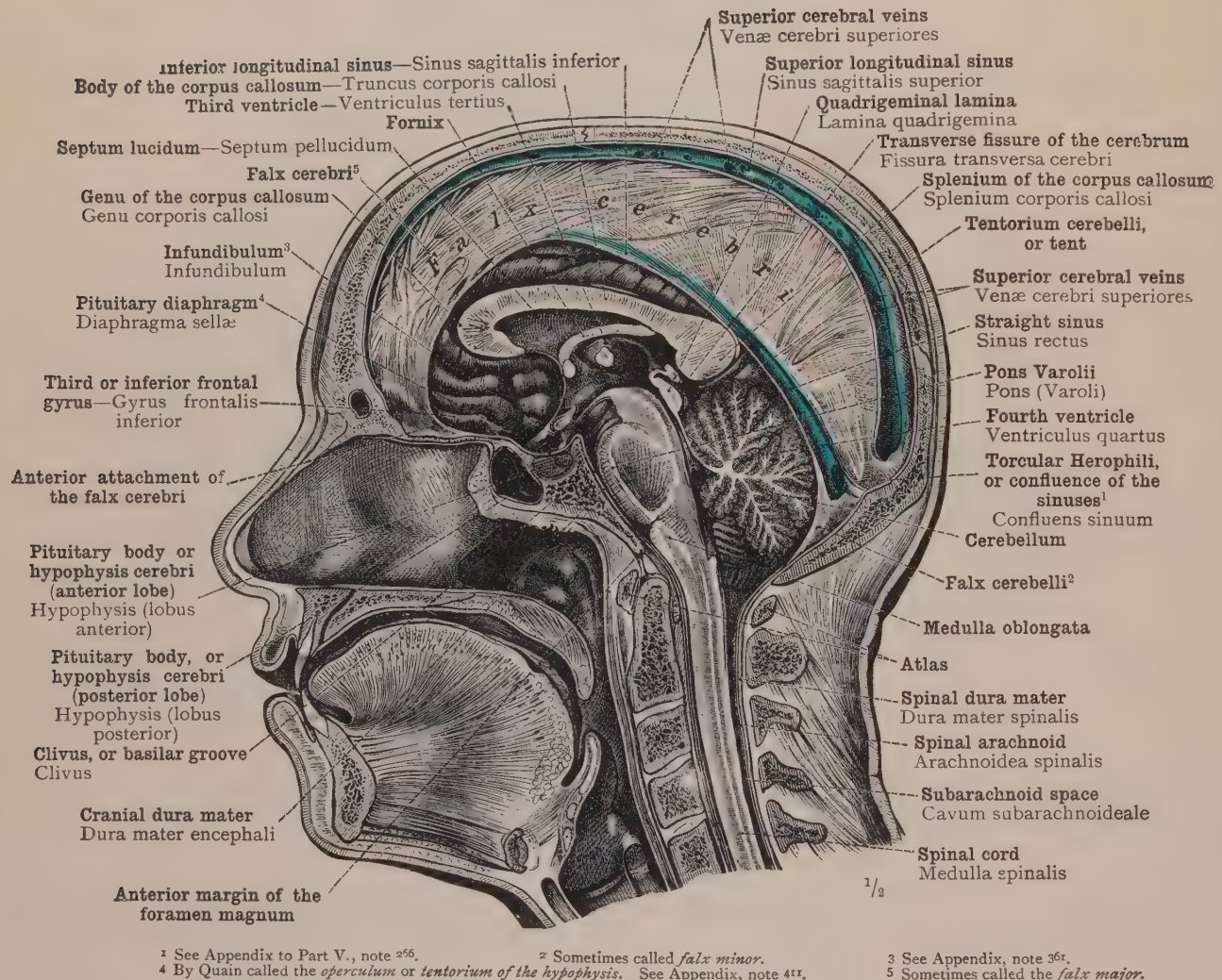


FIG. 1238.—THE CRANIAL DURA MATER, DURA MATER ENCEPHALI, DISPLAYED FROM BELOW IN CONTINUITY WITH THE SPINAL DURA MATER, DURA MATER SPINALIS, BY THE REMOVAL OF THE BASE OF THE SKULL AND THE UPPER CERVICAL VERTEBRÆ. THE TUBULAR PROLONGATIONS OF THE DURA MATER WHICH PASS ALONG THE CRANIAL AND SPINAL NERVES AS THEY LEAVE THE CEREBROSPINAL CAVITY ARE VISIBLE.

The basal sinuses of the dura mater (venous sinuses of the cranium, meningeal sinuses), sinus duræ matris, have been distended with blue resin, the arteries with red resin. On the left side of the body, the glossopharyngeal, pneumogastric or vagus, and spinal accessory nerves, and also the bulb or sinus of the internal jugular vein (*see Appendix to Part V., note* [121]) and the lowest part of the inferior petrosal sinus, have been drawn apart one from another in the region of the jugular foramen, in order that their mutual relations may be more clearly manifest.

1 Or *second division of the fifth cranial, trigeminal,* or *trifacial nerve.*
2 Or *third division of the fifth cranial, trigeminal,* or *trifacial nerve.*
3 *Seventh cranial nerve* in Soemmerring's enumeration; *portio dura of the seventh* in that of Willis.
4 *Eighth cranial nerve* in Soemmerring's enumeration; *portio mollis of the seventh* in that of Willis.
5 *Ninth cranial nerve* in Soemmerring's enumeration; *first trunk of the eighth* in that of Willis.
6 *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk of the eighth* in that of Willis.
7 *Eleventh cranial nerve* in Soemmerring's enumeration; *third trunk of the eighth* in that of Willis.
8 *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; also called the *lingual motor nerve.*
9 See Appendix to Part V., note 292. 10 See Appendix to Part V., note 121. 11 See Appendix, note 410.
12 Macalister calls this ligament *ligamentum latum axiale,* the broad axial ligament.



[1] See Appendix to Part V., note [256].
[2] Sometimes called *falx minor*.
[3] See Appendix, note [361].
[4] By Quain called the *operculum* or *tentorium of the hypophysis*. See Appendix, note [411].
[5] Sometimes called the *falx major*.

FIG. 1239.—SAGITTAL SECTION THROUGH THE HEAD, TO THE LEFT OF, BUT CLOSE TO, THE MEDIAN PLANE. RELATIONS OF THE FALX CEREBRI TO THE CORPUS CALLOSUM OR GREAT COMMISSURE AND TO THE INNER OR MESIAL SURFACE OF THE CEREBRAL HEMISPHERES. THE MUTUAL RELATIONS OF THE PONS VAROLII, THE MEDULLA OBLONGATA, THE CEREBELLUM, AND THE THIRD AND FOURTH VENTRICLES; AND, FURTHER, THE RELATION OF THE VARIOUS PARTS JUST ENUMERATED TO THE ROOF OF THE SKULL IN THE MEDIAN PLANE.

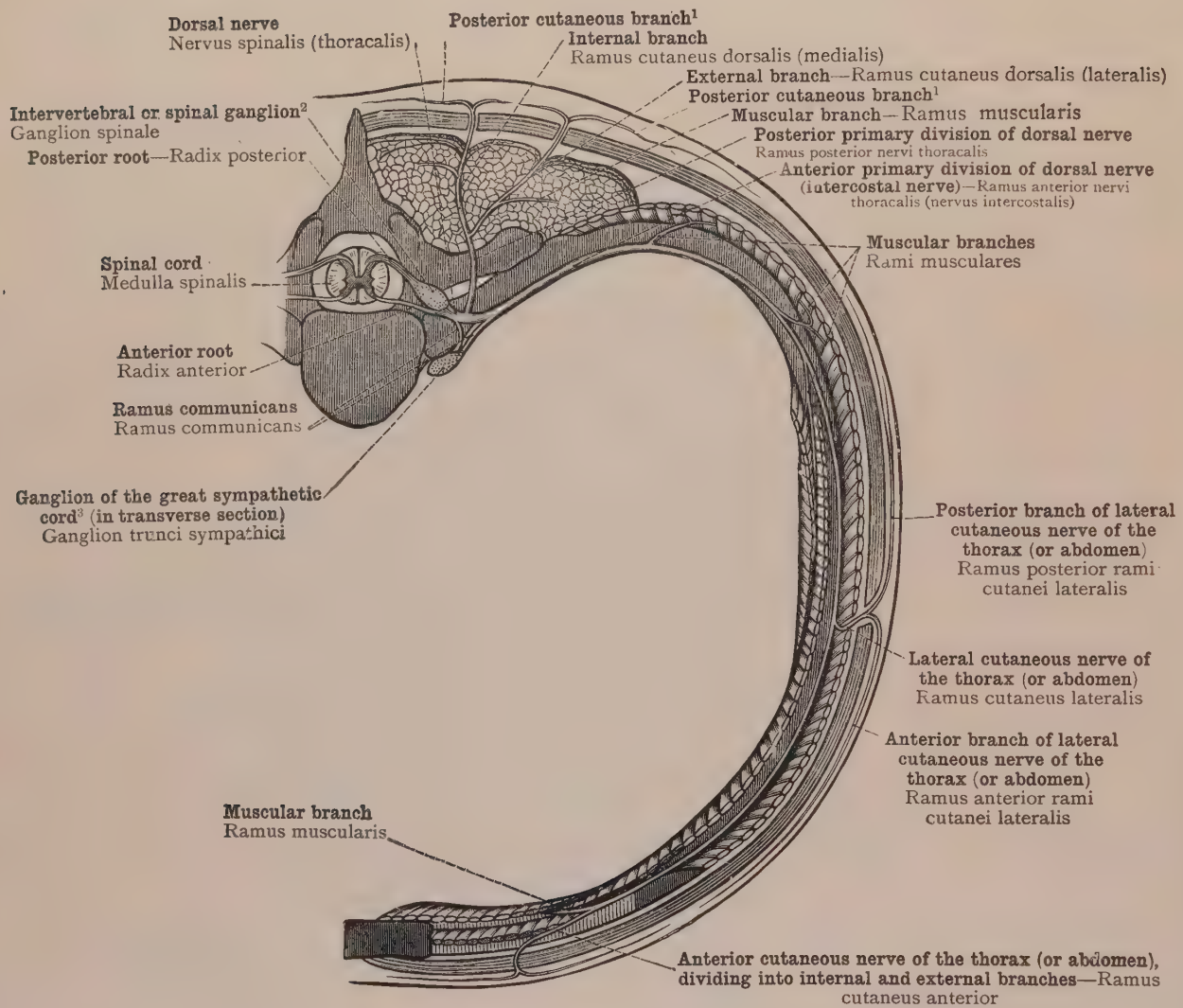
Meninges encephali—The membranes of the brain.

SYSTEMA NERVORUM PERIPHERICUM

THE PERIPHERAL NERVOUS SYSTEM

NERVI SPINALES

SPINAL NERVES


Dorsal nerve
Nervus spinalis (thoracalis)
Posterior cutaneous branch[1]
Internal branch
Ramus cutaneus dorsalis (medialis)
External branch—Ramus cutaneus dorsalis (lateralis)
Posterior cutaneous branch[1]
Muscular branch—Ramus muscularis
Posterior primary division of dorsal nerve
Ramus posterior nervi thoracalis
Anterior primary division of dorsal nerve
(intercostal nerve)—Ramus anterior nervi thoracalis (nervus intercostalis)
Intervertebral or spinal ganglion[2]
Ganglion spinale
Posterior root—Radix posterior
Muscular branches
Rami musculares
Spinal cord
Medulla spinalis
Anterior root
Radix anterior
Ramus communicans
Ramus communicans
Ganglion of the great sympathetic cord[3] (in transverse section)
Ganglion trunci sympathici
Posterior branch of lateral cutaneous nerve of the thorax (or abdomen)
Ramus posterior rami cutanei lateralis
Lateral cutaneous nerve of the thorax (or abdomen)
Ramus cutaneus lateralis
Anterior branch of lateral cutaneous nerve of the thorax (or abdomen)
Ramus anterior rami cutanei lateralis
Muscular branch
Ramus muscularis
Anterior cutaneous nerve of the thorax (or abdomen), dividing into internal and external branches—Ramus cutaneus anterior

1 See Appendix, note 413. 2 Also called the *ganglion of the posterior root*.
3 Called by Gaskell *vertebral* or *lateral ganglion* (*of the sympathetic*). 4 See Appendix, note 414.

FIG. 1240.—DIAGRAMMATIC REPRESENTATION OF THE DISTRIBUTION OF A DORSAL NERVE, NERVUS THORACALIS, IN A SEGMENT OF THE TRUNK. ANTERIOR PRIMARY DIVISION, RAMUS ANTERIOR (OR INTERCOSTAL NERVE—*see Appendix, note* 414—NERVUS INTERCOSTALIS), AND POSTERIOR PRIMARY DIVISION, RAMUS POSTERIOR. CONNEXION OF THE ANTERIOR PRIMARY DIVISION WITH THE GREAT GANGLIATED CORD OF THE SYMPATHETIC SYSTEM BY MEANS OF THE RAMUS COMMUNICANS.

Nerves of the Trunk.

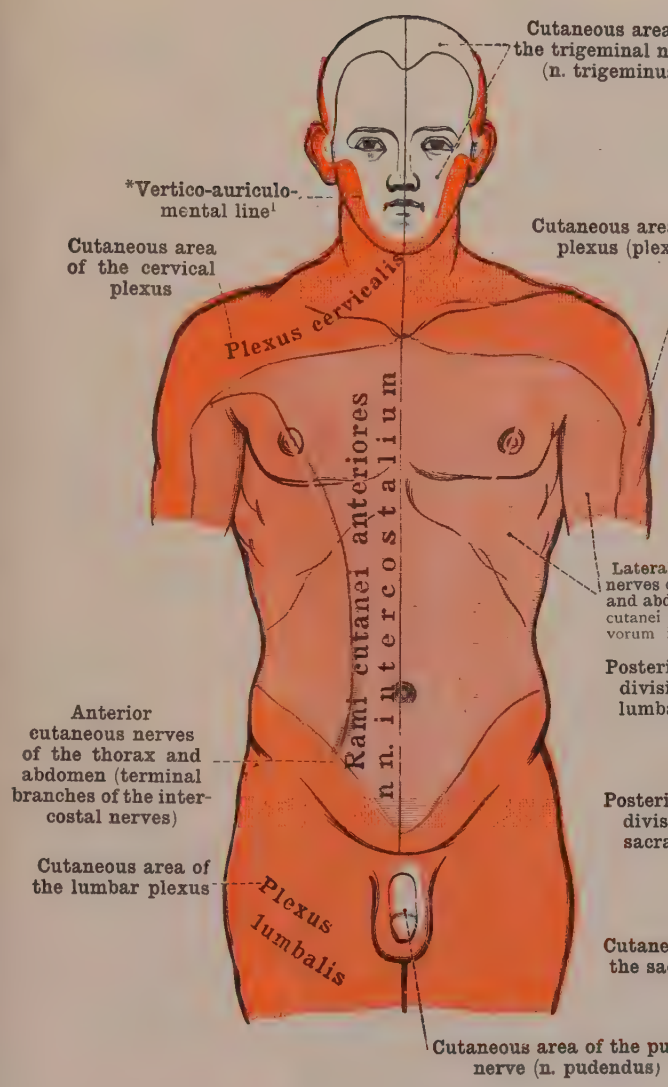

Cutaneous area of the trigeminal nerve (n. trigeminus)
*Vertico-auriculo-mental line[1]
Cutaneous area of the cervical plexus
Plexus cervicalis
Rami cutanei anteriores nn. intercostalium
Anterior cutaneous nerves of the thorax and abdomen (terminal branches of the intercostal nerves)
Cutaneous area of the lumbar plexus
Plexus lumbalis
Cutaneous area of the pudic nerve (n. pudendus)
Cutaneous area of the brachial plexus (plexus brachialis)
Lateral cutaneous nerves of the thorax and abdomen—Rami cutanei laterales nervorum intercostalium
Posterior primary divisions of the lumbar nerves
Posterior primary divisions of the sacral nerves
Cutaneous area of the sacral plexus

FIG. 1241.—THE CUTANEOUS AREAS OF THE NERVES OF THE TRUNK ON THE ANTERIOR SURFACE OF THE BODY.

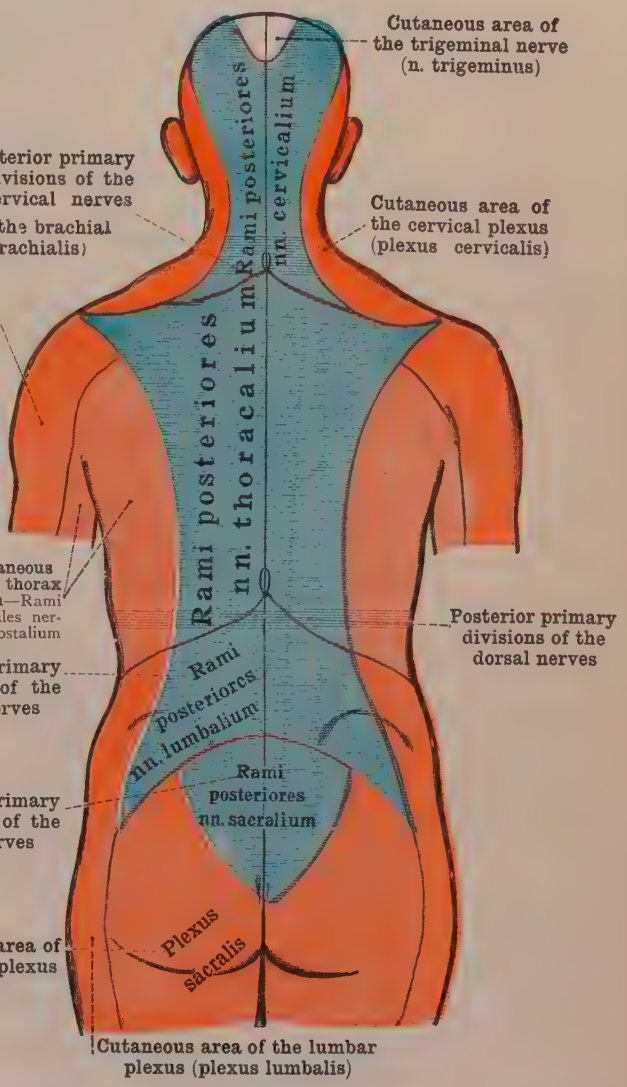

Cutaneous area of the trigeminal nerve (n. trigeminus)
Posterior primary divisions of the cervical nerves
Rami posteriores nn. cervicalium
Cutaneous area of the cervical plexus (plexus cervicalis)
Rami posteriores nn. thoracalium
Posterior primary divisions of the dorsal nerves
Rami posteriores nn. lumbalium
Rami posteriores nn. sacralium
Plexus sacralis
Cutaneous area of the lumbar plexus (plexus lumbalis)

FIG. 1242.—THE CUTANEOUS AREAS OF THE NERVES OF THE TRUNK ON THE POSTERIOR SURFACE OF THE BODY.

The cutaneous areas of the anterior primary divisions of the spinal nerves are tinted red; the cutaneous areas of the posterior primary divisions are tinted blue.

[1] **Vertico-auriculo-mental Line.*—"The area of distribution of the spinal nerves . . . embraces . . . the whole of the skin, with the exception of the skin of the face, the forehead, and the vertex; the upper boundary of this area being a line which extends from the vertex over the auricle through the external auditory meatus, thence curves with a forward convexity over the parotideomasseteric region, and descends obliquely to the chin" (Von Langer and Toldt, *op. cit.*, p. 676). "The cutaneous area of the trigeminal nerve is bounded by the above-described *vertico-auriculomental line* (*Scheitel-Ohr-Kinnlinie*), which is the upper limit of the cutaneous area of the spinal nerves" (*ibid.*, pp. 696, 697).

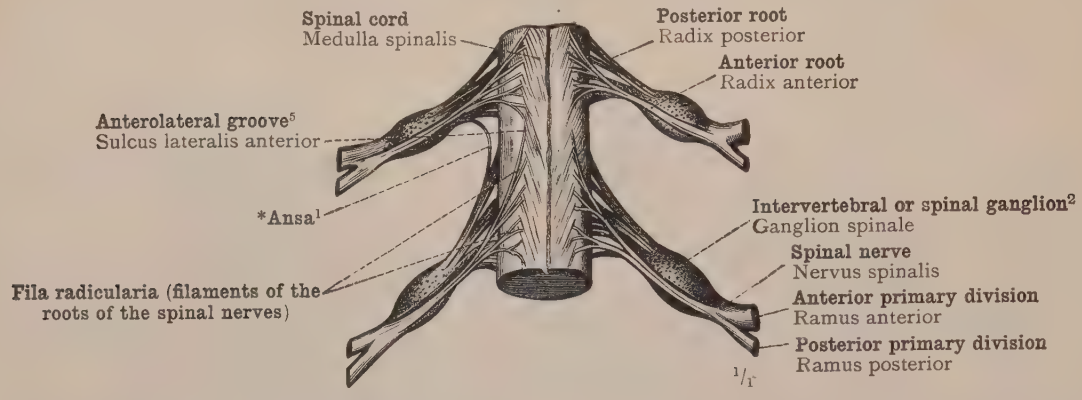
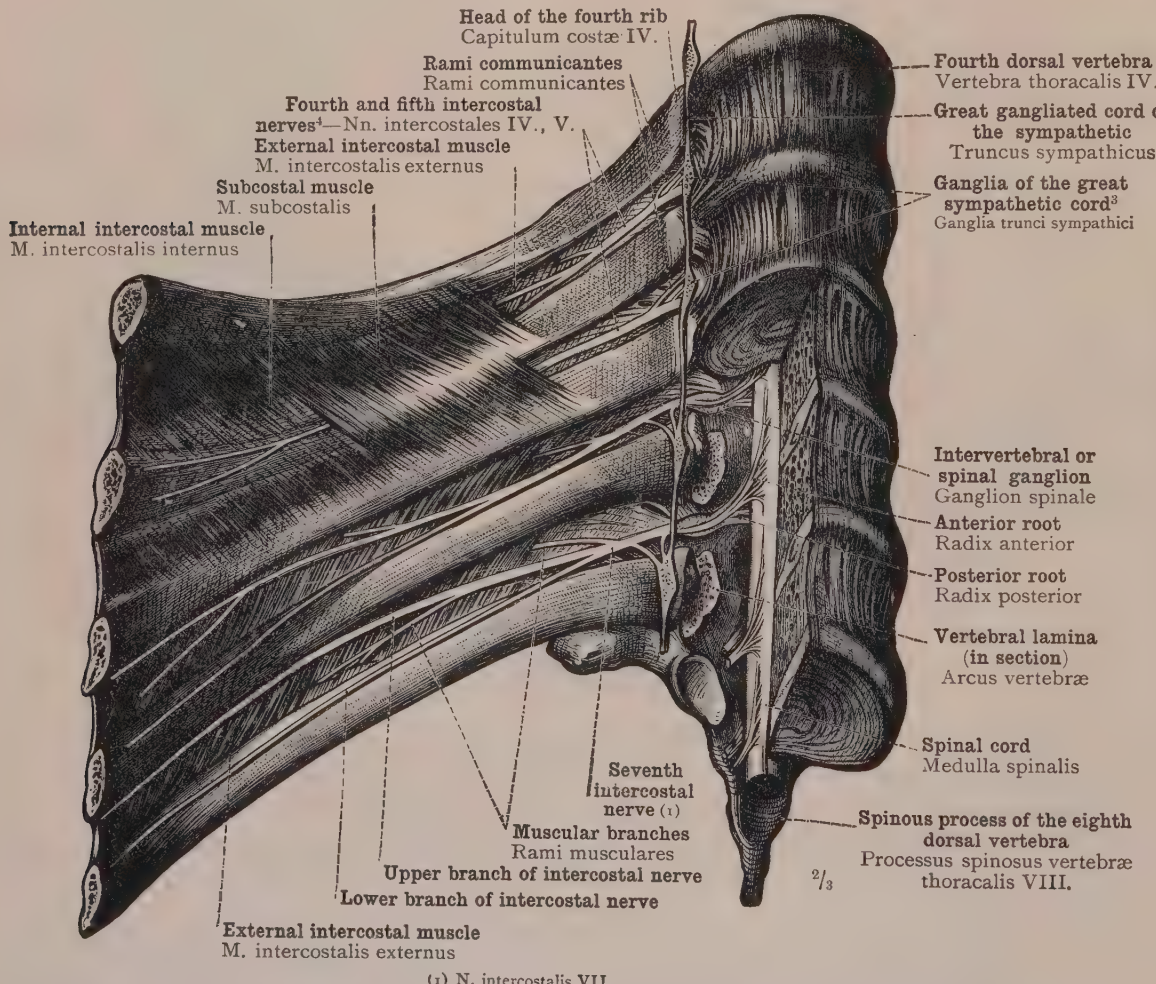


FIG. 1243.—THE UNION OF THE ANTERIOR AND POSTERIOR ROOTS OF THE SPINAL NERVES TO FORM THE MIXED TRUNKS OF THE SPINAL NERVES, NERVI SPINALES. THE INTERVERTEBRAL OR SPINAL GANGLIA (OR GANGLIA OF THE POSTERIOR ROOTS), GANGLIA SPINALIA.



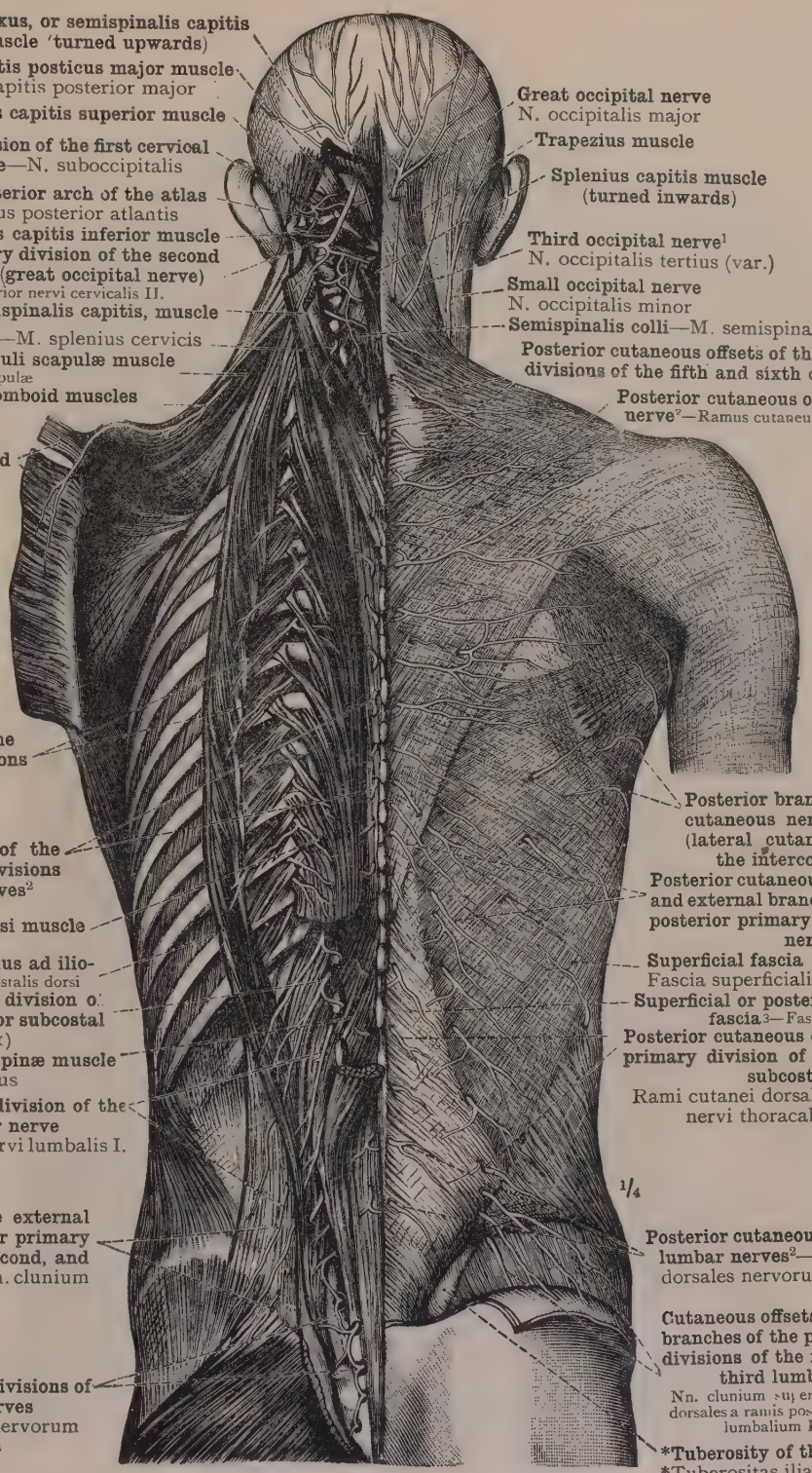
(1) N. intercostalis VII.

FIG. 1244.—COURSE AND RAMIFICATION OF THE ANTERIOR PRIMARY DIVISIONS OF THE DORSAL NERVES, NERVI THORACALES, CONSTITUTING THE INTERCOSTAL NERVES, NERVI INTERCOSTALES, AND THEIR CONNEXION WITH THE GREAT GANGLIATED CORD OF THE SYMPATHETIC, TRUNCUS SYMPATHICUS, AS SEEN FROM THE INTERIOR OF THE TRUNK.

In the sixth, seventh, and eighth dorsal vertebræ, the right half of the vertebral body has been cut away; and in the sixth and seventh intercostal spaces the internal intercostal muscle has been removed.

1 See Appendix, note 415. 2 Also called the *ganglion of the posterior root*.
3 Called by Gaskell *vertebral* or *lateral ganglia* (*of the sympathetic*). 4 See Appendix, note 414. 5 See Appendix, note 335.

Nerves of the Trunk.—Nervi intercostales—The intercostal nerves (*see Appendix, note* 414).



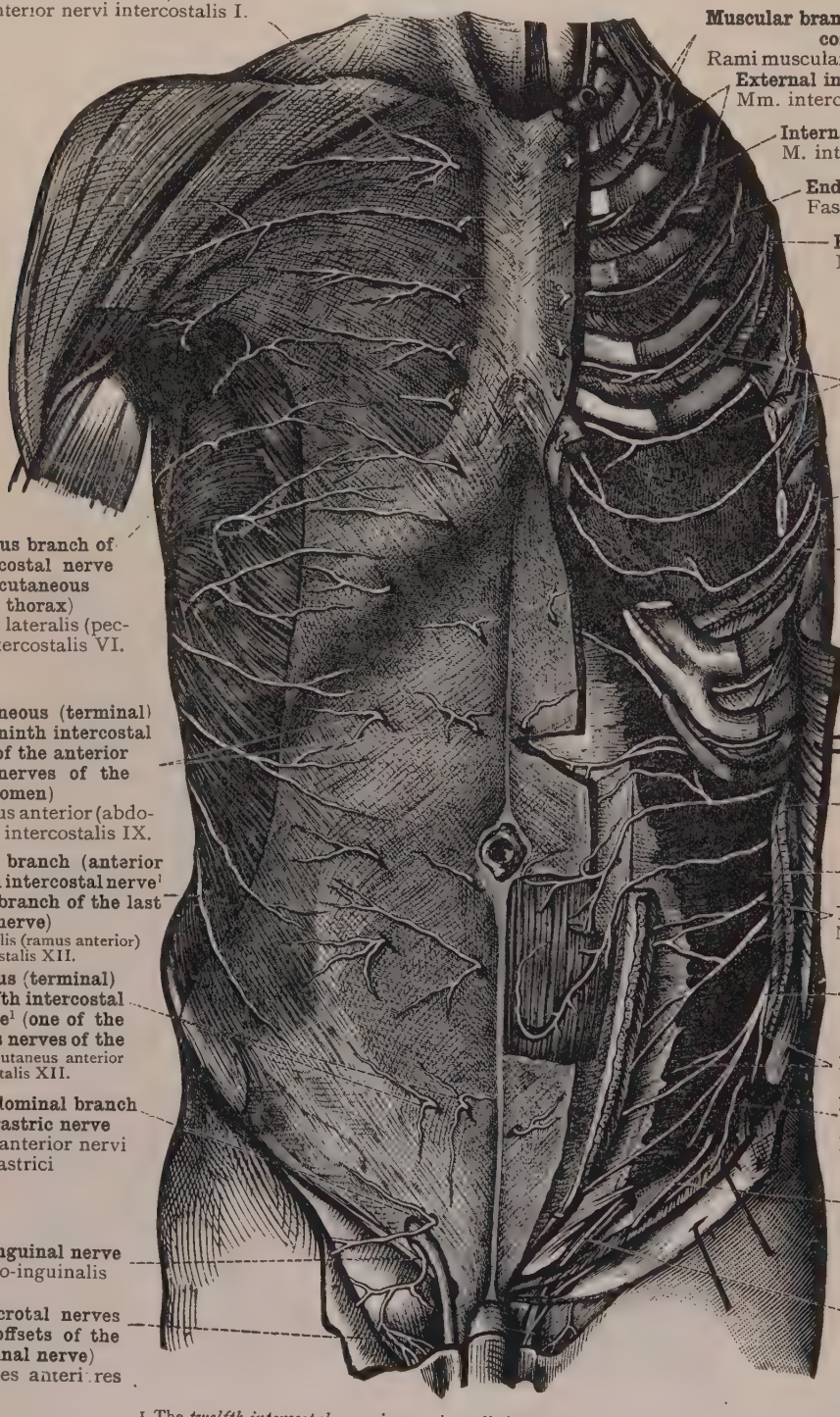
Complexus, or semispinalis capitis muscle (turned upwards)
Rectus capitis posticus major muscle
M. rectus capitis posterior major
Obliquus capitis superior muscle
Posterior primary division of the first cervical or suboccipital nerve—N. suboccipitalis
Posterior arch of the atlas
Arcus posterior atlantis
Obliquus capitis inferior muscle
Posterior primary division of the second cervical nerve (great occipital nerve)
Ramus posterior nervi cervicalis II.
Complexus, or semispinalis capitis, muscle
Splenius colli muscle—M. splenius cervicis
Levator anguli scapulæ muscle
M. levator scapulæ
Nerve to the rhomboid muscles
N. dorsalis scapulæ
Rhomboideus major and rhomboideus minor muscles
Mm. rhomboidei
External branches of the posterior primary divisions of the dorsal nerves[2]
Internal branches of the posterior primary divisions of the dorsal nerves[2]
Longissimus dorsi muscle
Musculus accessorius ad ilio-costalem—M. iliocostalis dorsi
Posterior primary division of the twelfth dorsal or subcostal nerve (1)
Multifidus spinæ muscle
M. multifidus
Posterior primary division of the first lumbar nerve
Ramus posterior nervi lumbalis I.
Cutaneous offsets of the external branches of the posterior primary divisions of the first, second, and third lumbar nerves—Nn. clunium superiores
Posterior primary divisions of the sacral nerves
Rami posteriores nervorum sacralium

Great occipital nerve
N. occipitalis major
Trapezius muscle
Splenius capitis muscle (turned inwards)
Third occipital nerve[1]
N. occipitalis tertius (var.)
Small occipital nerve
N. occipitalis minor
Semispinalis colli—M. semispinalis cervicis
Posterior cutaneous offsets of the posterior primary divisions of the fifth and sixth cervical nerves[2] (2)
Posterior cutaneous offset of the first dorsal nerve[2]—Ramus cutaneus dorsalis nervi thoracalis I
Posterior branches of the lateral cutaneous nerves of the thorax (lateral cutaneous branches of the intercostal nerves) (3)
Posterior cutaneous offsets of the internal and external branches respectively of the posterior primary divisions of the dorsal nerves[2] (4)
Superficial fascia
Fascia superficialis
Superficial or posterior layer of the lumbar fascia[3]—Fascia lumbodorsalis
Posterior cutaneous offsets of the posterior primary division of the twelfth dorsal or subcostal nerve[2]
Rami cutanei dorsales a ramo posteriore nervi thoracalis XII. orientes
1/4
Posterior cutaneous offsets of the lumbar nerves[2]—Rami cutanei dorsales nervorum lumbalium
Cutaneous offsets of the external branches of the posterior primary divisions of the first, second, and third lumbar nerves[2]
Nn. clunium superiores (rami cutanei dorsales a ramis posterioribus nervorum lumbalium I., II., III.)
***Tuberosity of the ilium**[4]
*Tuberositas iliaca

(1) Ramus posterior nervi thoracalis XII.
(2) Rami cutanei dorsales nervorum cervicalium V., VI.
(3) Rami posteriores ramorum cutaneorum lateralium nervorum intercostalium
(4) Rami cutanei dorsales a ramis posterioribus nervorum thoracalium orientes

FIG. 1245.—THE DISTRIBUTION OF THE POSTERIOR PRIMARY DIVISIONS, RAMI POSTERIORES, OF THE SPINAL NERVES, NERVI SPINALES. ON THE RIGHT SIDE OF THE BODY THE CUTANEOUS OFFSETS, ON THE LEFT SIDE THE MUSCULAR OFFSETS, ARE SHOWN; AND ON THE LEFT SIDE ALSO, IN PART, THE COURSE OF THE TRUNKS OF THE POSTERIOR PRIMARY DIVISIONS.

1 See Appendix, note 416. 2 See Append x, note 413.
3 For an account of the nomenclature of the different portions of the lumbar fascia, see footnotes to pp. 267 and 285, in Part III.
4 See footnote to p. 128, in Part I.

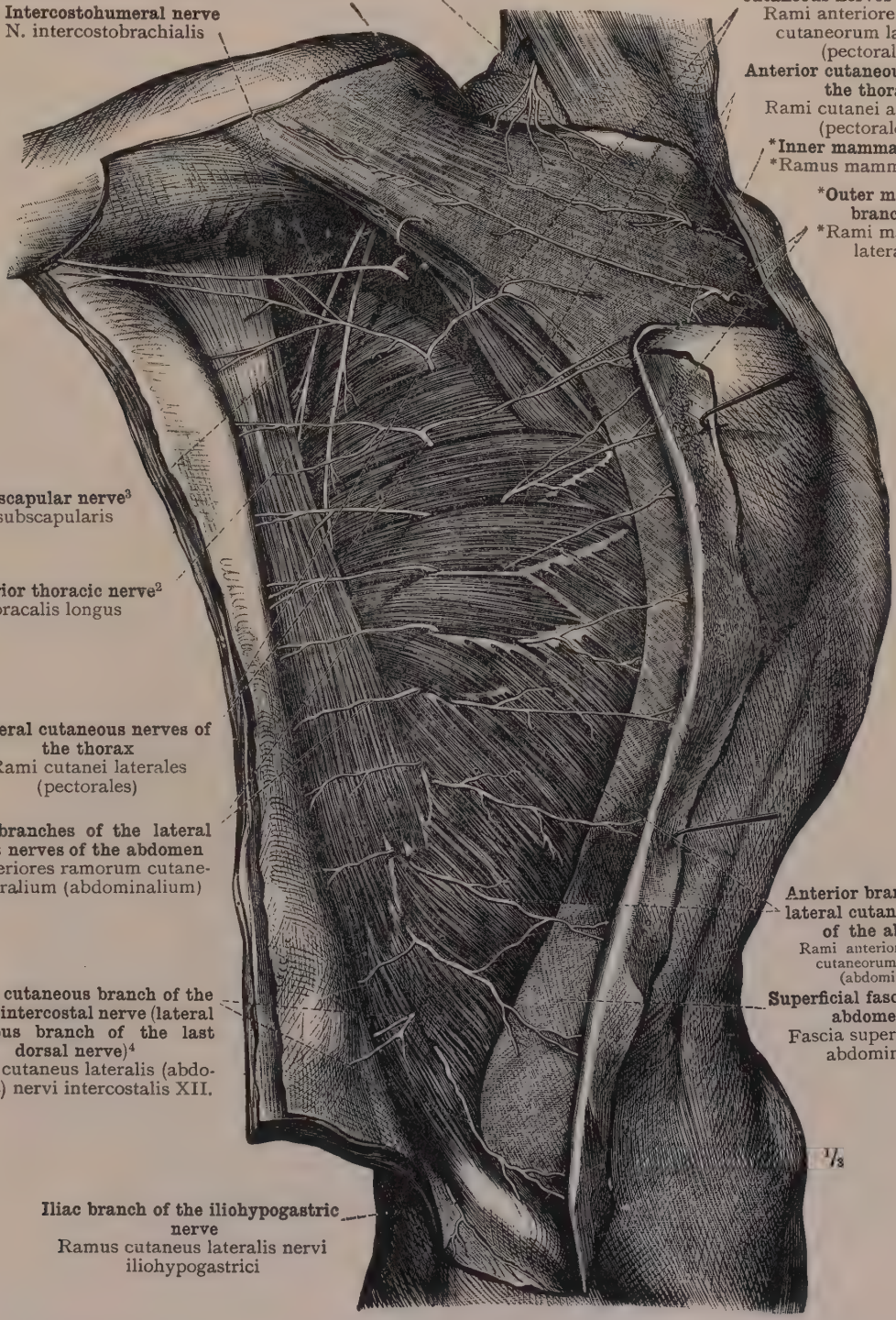

Anterior cutaneous (terminal) branch of the first intercostal nerve (first anterior cutaneous nerve of the thorax)—Ramus cutaneus anterior nervi intercostalis I.
Muscular branches of the first intercostal nerve
Rami musculares nervi intercostalis I.
External intercostal muscles
Mm. intercostales externi
Internal intercostal muscle
M. intercostalis internus
Endothoracic fascia
Fascia endothoracica
Fourth intercostal nerve
N. intercostalis IV.
Endothoracic fascia
Fascia endothoracica
Seventh intercostal nerve
N. intercostalis VII.
Muscular branch
Ramus muscularis
Lateral cutaneous branch of the sixth intercostal nerve (sixth lateral cutaneous nerve of the thorax)
Ramus cutaneus lateralis (pectoralis) nervi intercostalis VI.
External oblique muscle of the abdomen
M. obliquus externus abdominis
Anterior cutaneous (terminal) branch of the ninth intercostal nerve (one of the anterior cutaneous nerves of the abdomen)
Ramus cutaneus anterior (abdominalis) nervi intercostalis IX.
Internal oblique muscle of the abdomen
M. obliquus internus abdominis
Lateral cutaneous branch (anterior offset) of the twelfth intercostal nerve[1] (lateral cutaneous branch of the last dorsal nerve)
Ramus cutaneus lateralis (ramus anterior) nervi intercostalis XII.
Transversalis abdominis muscle
M. transversus abdominis
Twelfth intercostal nerve
N. intercostalis XII.
Anterior cutaneous (terminal) branch of the twelfth intercostal (last dorsal) nerve[1] (one of the anterior cutaneous nerves of the abdomen)—Ramus cutaneus anterior nervi intercostalis XII.
Iliohypogastric nerve
N. iliohypogastricus
Hypogastric or abdominal branch of the iliohypogastric nerve
Ramus cutaneus anterior nervi iliohypogastrici
Muscular branches
Rami musculares
Muscular branch of the ilio-inguinal nerve
Ramus muscularis nervi ilio-inguinalis
Ilio-inguinal nerve
N. ilio-inguinalis
Ilio-inguinal nerve
N. ilio-inguinalis
Anterior scrotal nerves (terminal offsets of the ilio-inguinal nerve)
Nn. scrotales anteriores
Genital branch of the genitocrural nerve
N. spermaticus externus
1/3

[1] The *twelfth intercostal nerve* is sometimes distinguished as the *subcostal nerve.*

FIG. 1246.—THE CUTANEOUS NERVES OF THE ANTERIOR SURFACE OF THE TRUNK.

In order to demonstrate the course of the intercostal nerves, the sixth and seventh ribs and the cartilage of the eighth rib were on the left side partially removed; the situation of the removed segments is, however, indicated by dotted lines. The external and internal intercostal muscles, and also the external and internal oblique muscles of the abdomen and the rectus abdominis muscle, were partially removed.

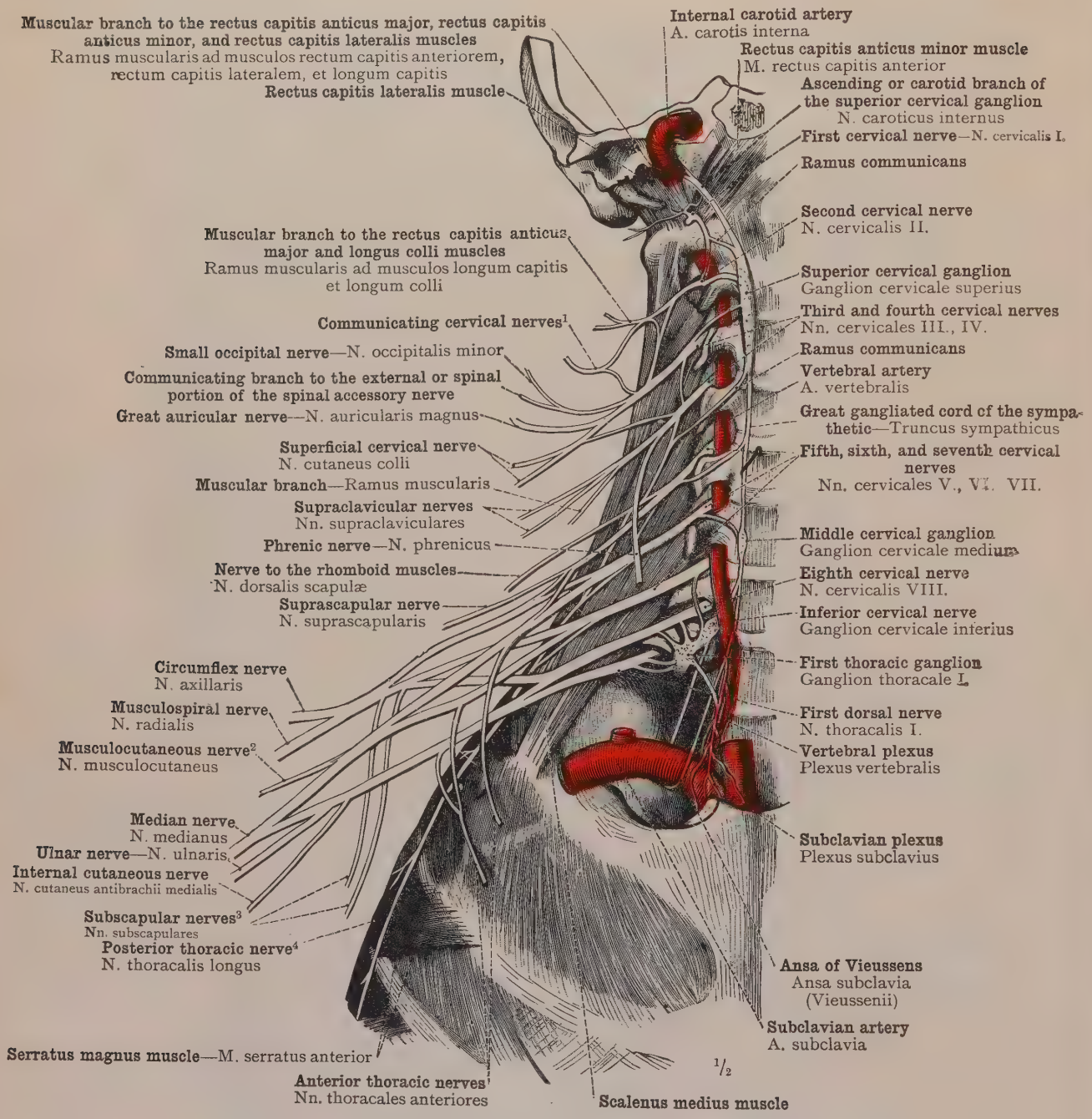
Nerves of the Trunk.—Rami anteriores nervorum intercostalium—Anterior cutaneous nerves of the thorax and abdomen.


Supraclavicular nerves—Nn. supraclaviculares
Superficial pectoral fascia—Fascia superficialis pectoris
Intercostohumeral nerve
N. intercostobrachialis
Anterior branches of lateral cutaneous nerves of the thorax
Rami anteriores ramorum cutaneorum lateralium (pectoralium)
Anterior cutaneous nerves of the thorax
Rami cutanei anteriores (pectorales)
*Inner mammary branch[1]
*Ramus mammarius medialis
*Outer mammary branches[1]
*Rami mammarii laterales
Subscapular nerve[3]
N. subscapularis
Posterior thoracic nerve[2]
N. thoracalis longus
Lateral cutaneous nerves of the thorax
Rami cutanei laterales (pectorales)
Posterior branches of the lateral cutaneous nerves of the abdomen
Rami posteriores ramorum cutaneorum lateralium (abdominalium)
Anterior branches of the lateral cutaneous nerves of the abdomen
Rami anteriores ramorum cutaneorum lateralium (abdominalium)
Lateral cutaneous branch of the twelfth intercostal nerve (lateral cutaneous branch of the last dorsal nerve)[4]
Ramus cutaneus lateralis (abdominalis) nervi intercostalis XII.
Superficial fascia of the abdomen
Fascia superficialis abdominis
1/3
Iliac branch of the iliohypogastric nerve
Ramus cutaneus lateralis nervi iliohypogastrici

[1] See Appendix, note 417.
[2] Formerly known as the *external respiratory nerve of Bell.*
[3] See Appendix, note 418.
[4] The *twelfth intercostal nerve* is sometimes distinguished as the *subcostal nerve.*

FIG. 1247.—THE CUTANEOUS NERVES OF THE RIGHT SIDE OF THE TRUNK; THE LATERAL CUTANEOUS NERVES OF THE THORAX AND ABDOMEN (LATERAL CUTANEOUS BRANCHES OF THE INTERCOSTAL NERVES, RAMI CUTANEI LATERALES NERVORUM INTERCOSTALIUM). INTERCOSTOHUMERAL NERVES, A HUMERAL OFFSET ARISING IN THIS SPECIMEN FROM THE LATERAL CUTANEOUS OFFSET, NOT ONLY OF THE SECOND, BUT ALSO OF THE THIRD INTERCOSTAL NERVE.

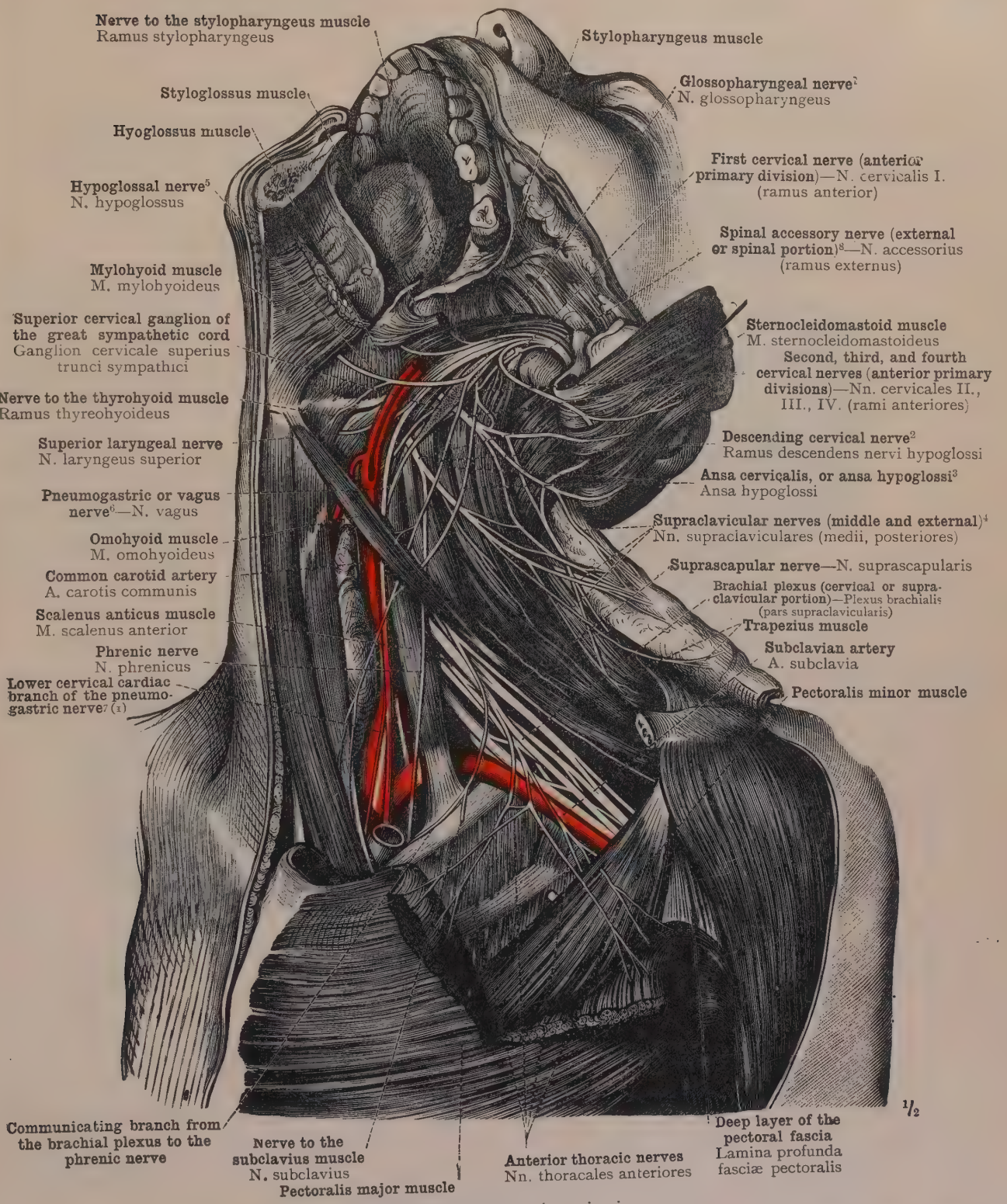
Nerves of the Trunk.—Rami cutanei laterales nervorum intercostalium—Lateral cutaneous nerves of the thorax and abdomen.



[1] See Appendix, note 419.
[2] Sometimes called the *external cutaneous nerve.*
[3] See Appendix note 418.
[4] Formerly known as the *external respiratory nerve of Bell.*

FIG. 1248.—FORMATION OF THE CERVICAL PLEXUS FROM THE ANTERIOR PRIMARY DIVISIONS OF THE FOUR UPPER CERVICAL NERVES, AND THE FORMATION OF THE BRACIAL PLEXUS FROM THE ANTERIOR PRIMARY DIVISIONS OF THE FOUR LOWER CERVICAL NERVES AND THE FIRST DORSAL NERVE. THE NAMED NERVES ARISING FROM THE CERVICAL PLEXUS AND THE BRACHIAL PLEXUS. THE COMMUNICATIONS BETWEEN THE CERVICAL NERVES AND THE GANGLIA OF THE GREAT SYMPATHETIC CORD.

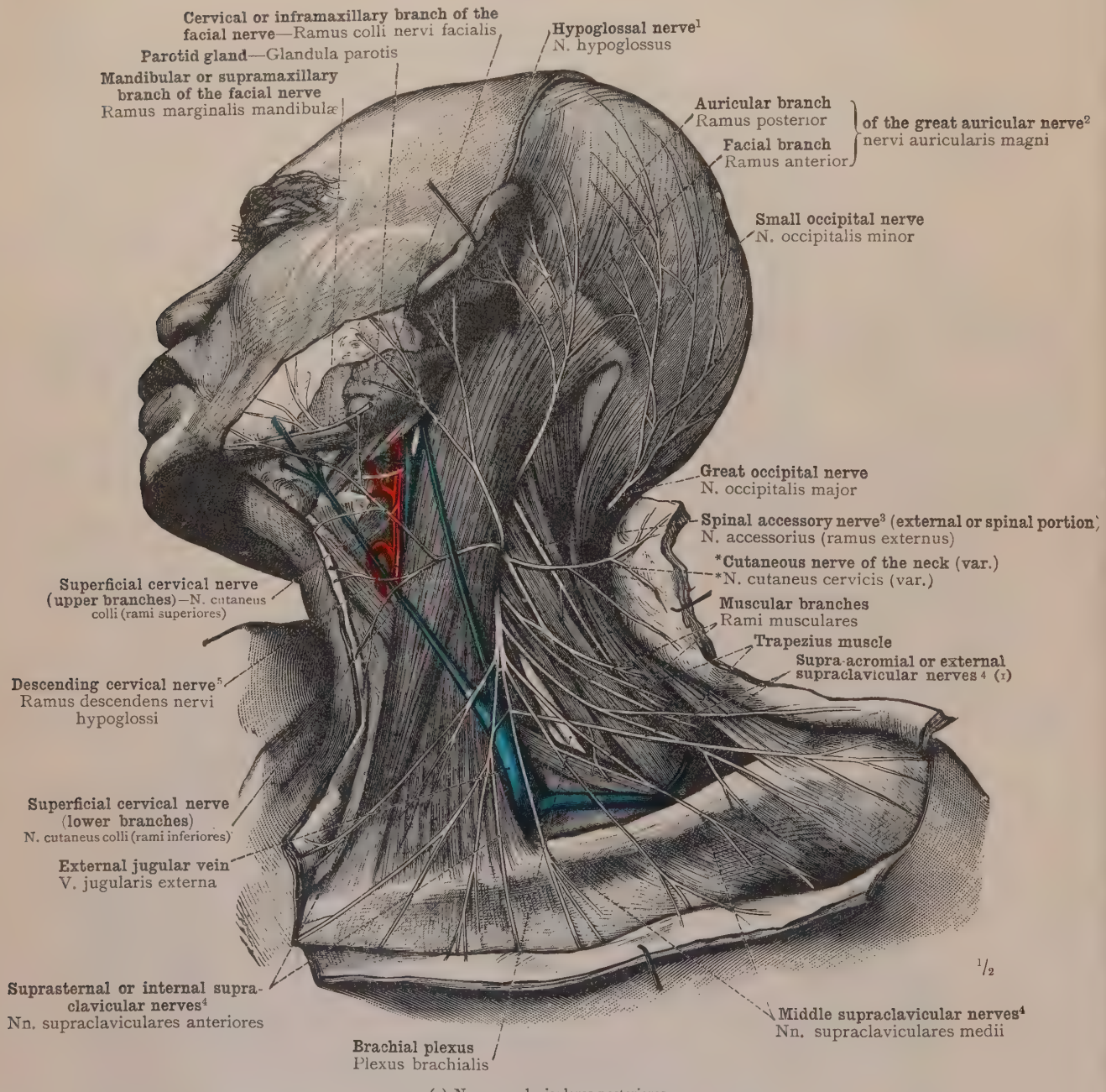
Plexus cervicalis—Cervical plexus.—Plexus brachialis—Brachial plexus.



(1) Ramus cardiacus superior nervi vagi

FIG. 1249.—THE DEEP NERVES OF THE NECK, DISPLAYED BY THE REMOVAL OF THE STERNOCLEIDOMASTOID MUSCLE. BY THE PARTIAL REMOVAL OF THE CLAVICLE THE BRACHIAL PLEXUS HAS ALSO BEEN EXPOSED.

1 *Ninth cranial nerve* in Soemmerring's enumeration; *first trunk* of the *eighth cranial nerve* in that of Willis.
2 See Appendix, note 420. 3 See Appendix, note 421.
4 *Supraclavicular Nerves.*—These are arranged in three groups: *internal* or *suprasternal*; *middle* or *supraclavicular* (*proper*); and *external* or *supra-acromial*, also called *posterior branches*.
5 *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; also known as the *lingual motor nerve*.
6 *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.
7 See Appendix, note 422.
8 *Eleventh cranial nerve* in Soemmerring's enumeration; *third trunk* of the *eighth cranial nerve* in that of Willis.



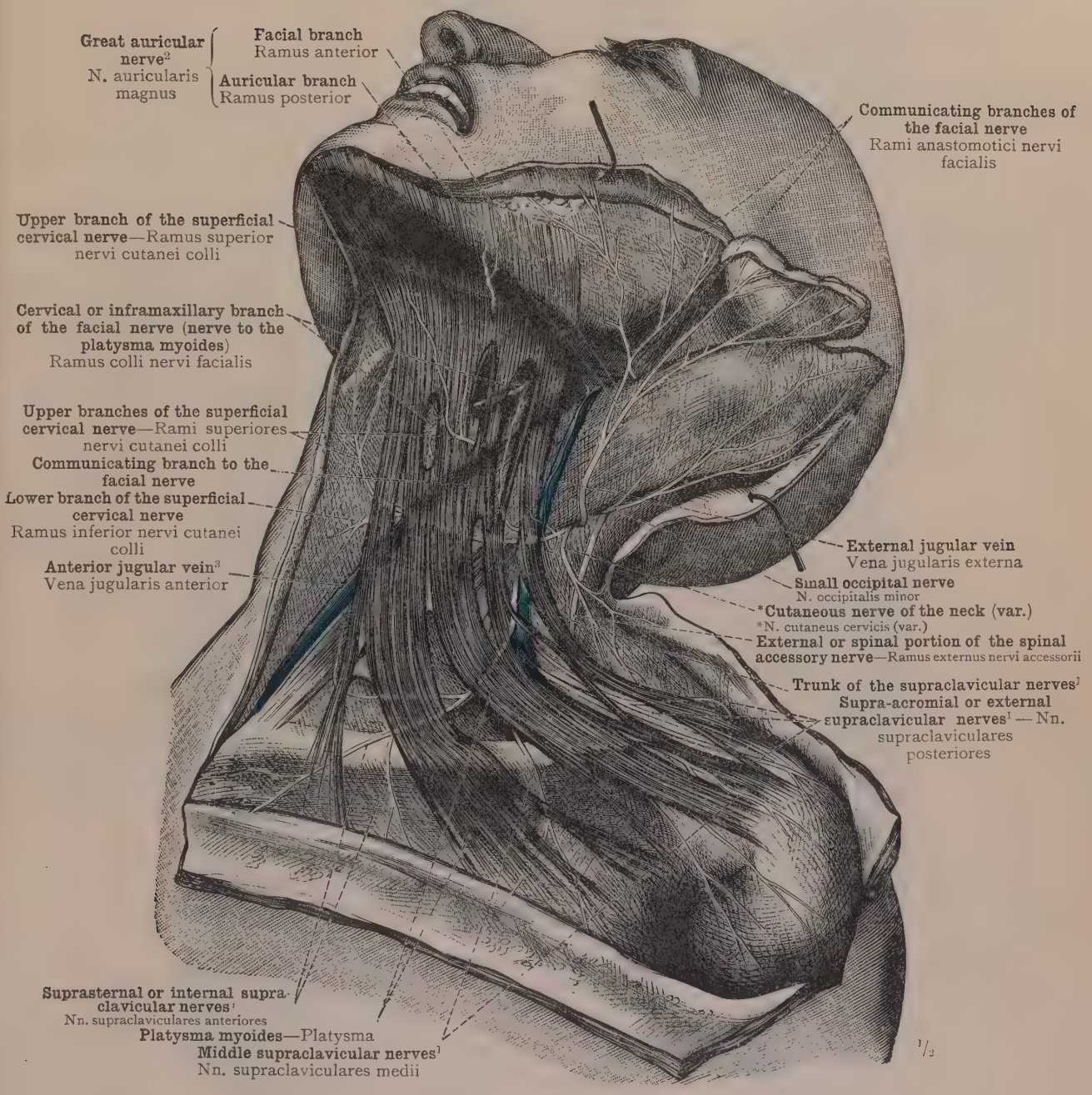
(1) Nn. supraclaviculares posteriores

FIG. 1250.—THE CUTANEOUS NERVES OF THE HEAD AND NECK THAT ARE DERIVED FROM THE CERVICAL PLEXUS, AND THE MUSCULAR BRANCHES OF THE SAME PLEXUS THAT SUPPLY THE TRAPEZIUS AND LEVATOR ANGULI SCAPULÆ MUSCLES. THE EXTERNAL OR SPINAL PORTION OF THE SPINAL ACCESSORY NERVE. THE GREAT OCCIPITAL NERVE, N. OCCIPITALIS MAJOR. THE MANDIBULAR OR SUPRAMAXILLARY BRANCH OF THE FACIAL NERVE, RAMUS MARGINALIS MANDIBULÆ NERVI FACIALIS, AND THE COMMUNICATION BETWEEN THIS NERVE AND THE UPPER BRANCH OF THE SUPERFICIAL CERVICAL NERVE, N. CUTANEUS COLLI.

The nerves are displayed by the removal of the platysma myoides and the deep cervical fascia.

1 *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth cranial nerve* in that of Willis; also known as the *lingual motor nerve.*
2 See Appendix, note 423.
3 *Eleventh cranial nerve* in Soemmerring's enumeration; *third trunk* of the *eighth cranial nerve* in that of Willis.
4 See note [4] to p. 817.
5 Often called the *descendens noni nerve.* See Appendix, note 420

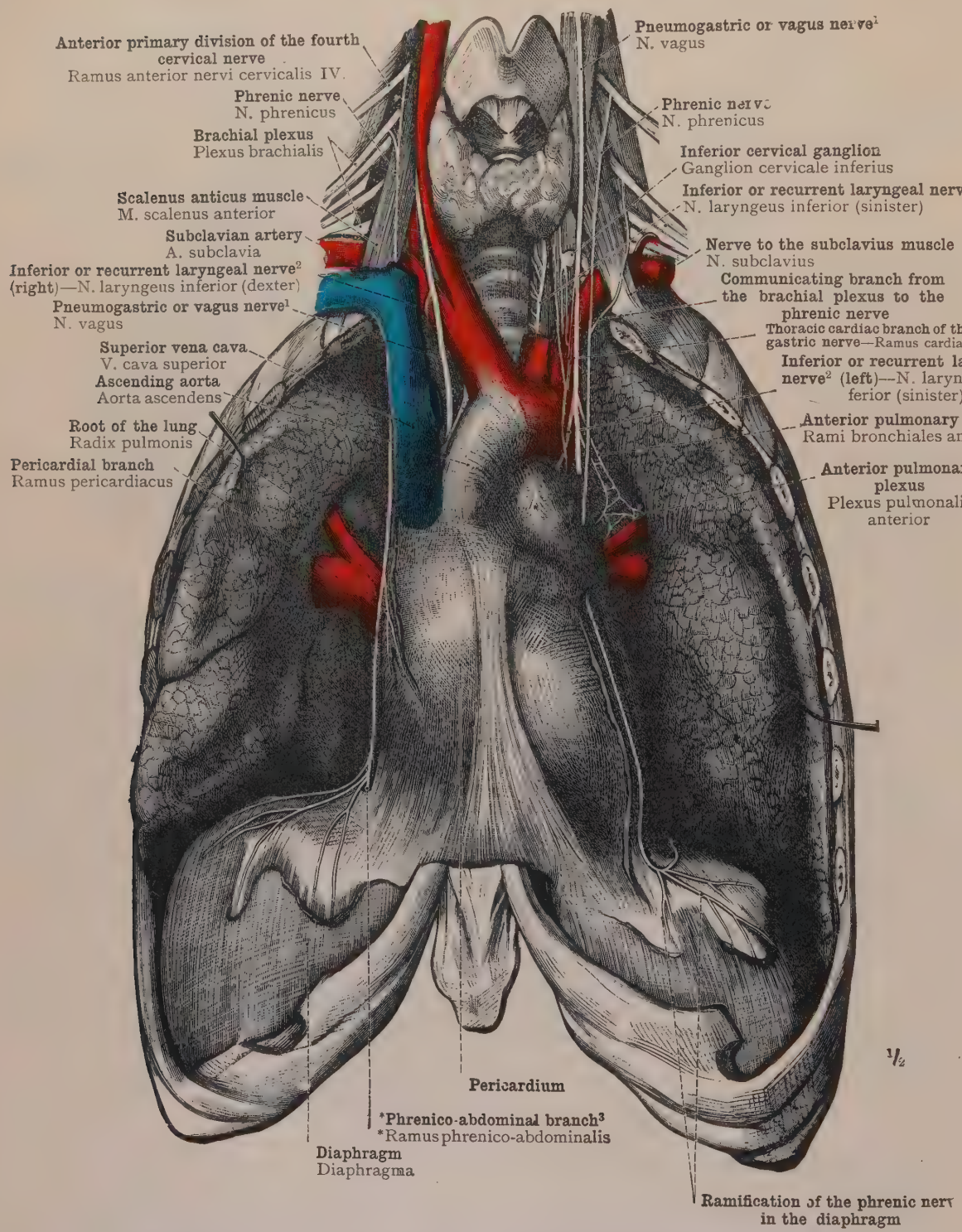
Nerves of the Neck.


Great auricular nerve[2]
N. auricularis magnus
Facial branch
Ramus anterior
Auricular branch
Ramus posterior
Communicating branches of the facial nerve
Rami anastomotici nervi facialis
Upper branch of the superficial cervical nerve—Ramus superior nervi cutanei colli
Cervical or inframaxillary branch of the facial nerve (nerve to the platysma myoides)
Ramus colli nervi facialis
Upper branches of the superficial cervical nerve—Rami superiores nervi cutanei colli
Communicating branch to the facial nerve
Lower branch of the superficial cervical nerve
Ramus inferior nervi cutanei colli
Anterior jugular vein[3]
Vena jugularis anterior
External jugular vein
Vena jugularis externa
Small occipital nerve
N. occipitalis minor
*Cutaneous nerve of the neck (var.)
*N. cutaneus cervicis (var.)
External or spinal portion of the spinal accessory nerve—Ramus externus nervi accessorii
Trunk of the supraclavicular nerves[1]
Supra-acromial or external supraclavicular nerves[1]—Nn. supraclaviculares posteriores
Suprasternal or internal supraclavicular nerves[1]
Nn. supraclaviculares anteriores
Platysma myoides—Platysma
Middle supraclavicular nerves[1]
Nn. supraclaviculares medii
1/2

[1] See note 4 to p. 817. [2] See Appendix, note 423.
[3] *Anterior Jugular Vein.*—Macalister used the term *vena mediana colli* as an alternative name for this vein. See Appendix to Part V., note 197.

FIG. 1251.—THE CUTANEOUS NERVES OF THE HEAD AND NECK THAT ARE DERIVED FROM THE CERVICAL PLEXUS, IN RELATION TO THE PLATYSMA MYOIDES. THE FASCICULI OF THE LATTER ARE SEPARATED HERE AND THERE, IN ORDER TO DISPLAY IN THE INTERVALS THUS MADE THE NERVES COVERED BY THE MUSCLE.

Nerves of the Neck.

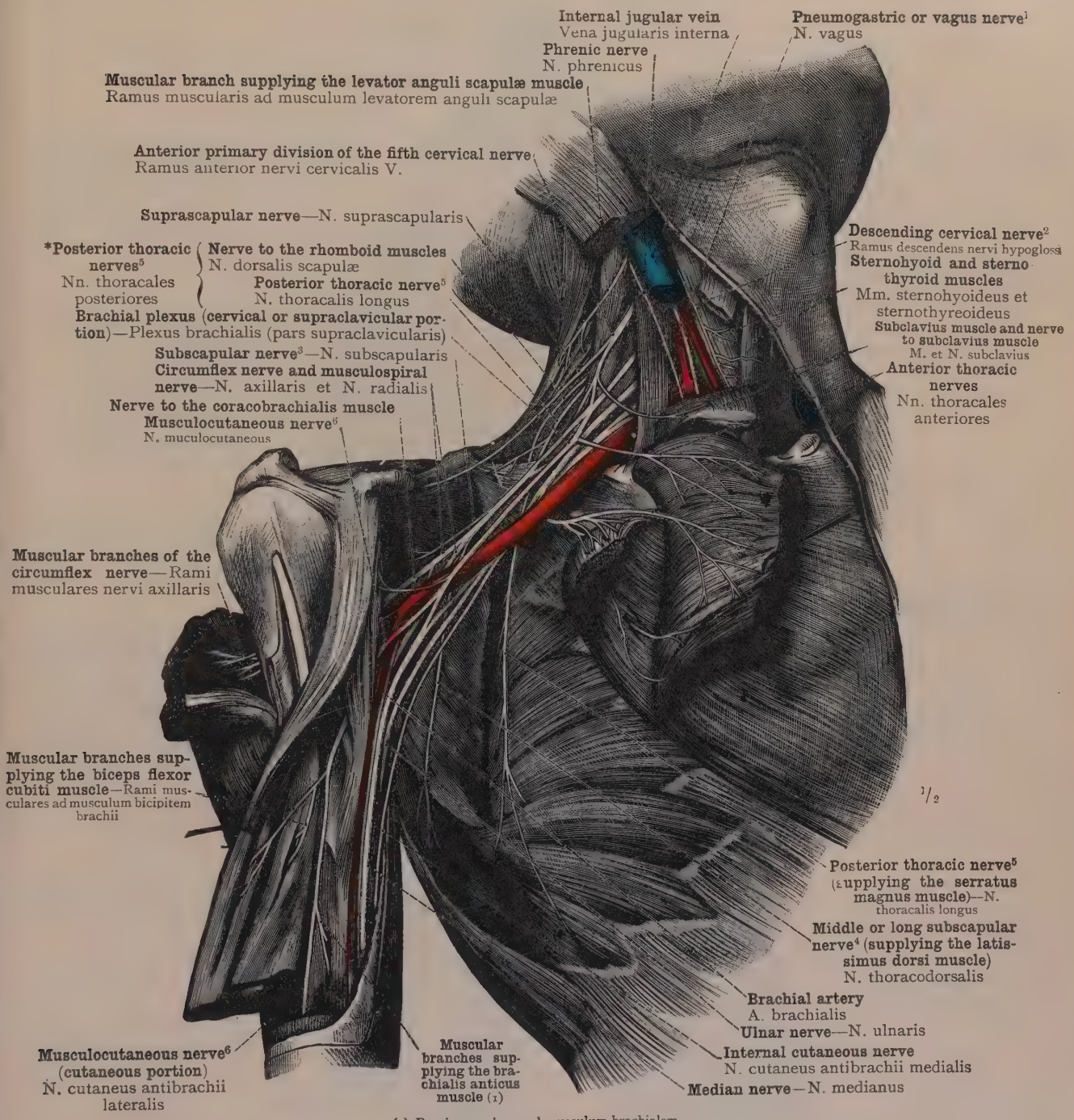


[1] *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.
[2] See note 3 to p. 872.
[3] See Appendix, note 424.

FIG. 1252.—THE PHRENIC OR DIAPHRAGMATIC NERVE, NERVUS PHRENICUS, AND ITS RELATIONS WITH THE VAGUS NERVE.

In the thoracic region, the phrenic nerves were exposed by drawing apart the anterior borders of the lungs, and their course along the side of the pericardium was displayed by an incision through the pericardial pleura.

Nervus phrenicus—The phrenic nerve.


Internal jugular vein
Vena jugularis interna
Pneumogastric or vagus nerve[1]
N. vagus
Phrenic nerve
N. phrenicus
Muscular branch supplying the levator anguli scapulæ muscle
Ramus muscularis ad musculum levatorem anguli scapulæ
Anterior primary division of the fifth cervical nerve
Ramus anterior nervi cervicalis V.
Suprascapular nerve—N. suprascapularis
*Posterior thoracic nerves[5] Nn. thoracales posteriores
Nerve to the rhomboid muscles
N. dorsalis scapulæ
Posterior thoracic nerve[5]
N. thoracalis longus
Brachial plexus (cervical or supraclavicular portion)—Plexus brachialis (pars supraclavicularis)
Subscapular nerve[3]—N. subscapularis
Circumflex nerve and musculospiral nerve—N. axillaris et N. radialis
Nerve to the coracobrachialis muscle
Musculocutaneous nerve[6]
N. musculocutaneous
Descending cervical nerve[2]
Ramus descendens nervi hypoglossi
Sternohyoid and sternothyroid muscles
Mm. sternohyoideus et sternothyreoideus
Subclavius muscle and nerve to subclavius muscle
M. et N. subclavius
Anterior thoracic nerves
Nn. thoracales anteriores
Muscular branches of the circumflex nerve—Rami musculares nervi axillaris
Muscular branches supplying the biceps flexor cubiti muscle—Rami musculares ad musculum bicipitem brachii
1/2
Posterior thoracic nerve[5] (supplying the serratus magnus muscle)—N. thoracalis longus
Middle or long subscapular nerve[4] (supplying the latissimus dorsi muscle)
N. thoracodorsalis
Brachial artery
A. brachialis
Ulnar nerve—N. ulnaris
Internal cutaneous nerve
N. cutaneus antibrachii medialis
Median nerve—N. medianus
Musculocutaneous nerve[6] (cutaneous portion)
N. cutaneus antibrachii lateralis
Muscular branches supplying the brachialis anticus muscle (1)

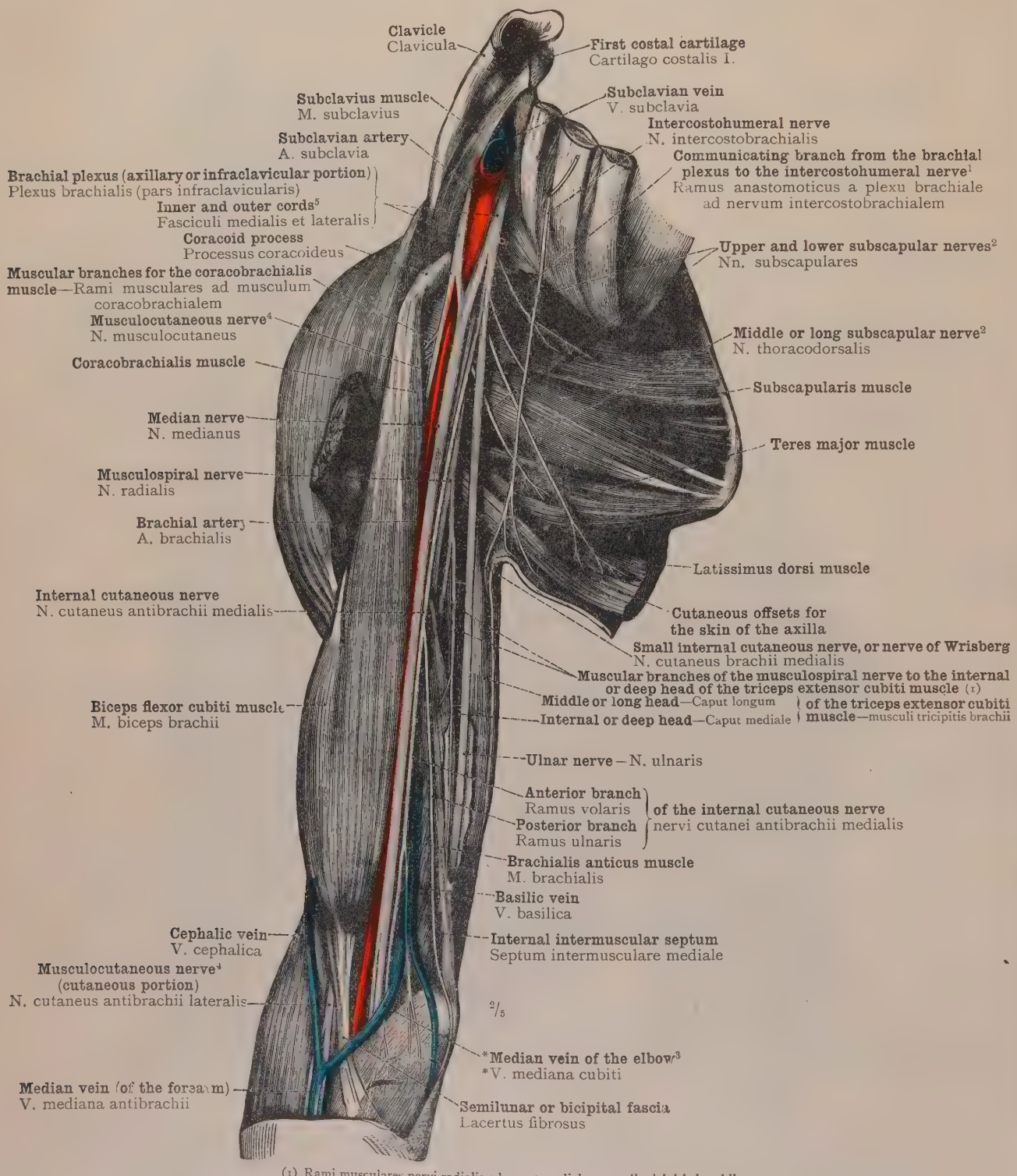
(1) Rami musculares ad musculum brachialem

FIG. 1253.—THE NERVES DERIVED FROM THE BRACHIAL PLEXUS FOR THE SUPPLY OF THE MUSCLES OF THE SHOULDER-JOINT, THE MUSCLES CONNECTING THE ARM WITH THE TRUNK, AND THE MUSCLES OF THE SHOULDER-GIRDLE. THE MOTOR OFFSETS OF THE MUSCULOCUTANEOUS (OR EXTERNAL CUTANEOUS) NERVE.

The pectoralis major and pectoralis minor muscles were cut across near their distal extremities and turned inwards; the muscles attached to the clavicle were also detached from that bone and turned aside; the deltoid muscle was divided and turned downwards; the biceps divided and turned outwards. The sternoclavicular and acromioclavicular articulations were cut through and the clavicle was removed.

1 *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.
2 Often called the *descendens noni nerve*. See Appendix, note 420.
3 See Appendix, note 418.
4 See Appendix, note 418.
5 See Appendix, note 425.
6 Sometimes called the *external cutaneous nerve*.

Motor Nerves of the Brachial Plexus.

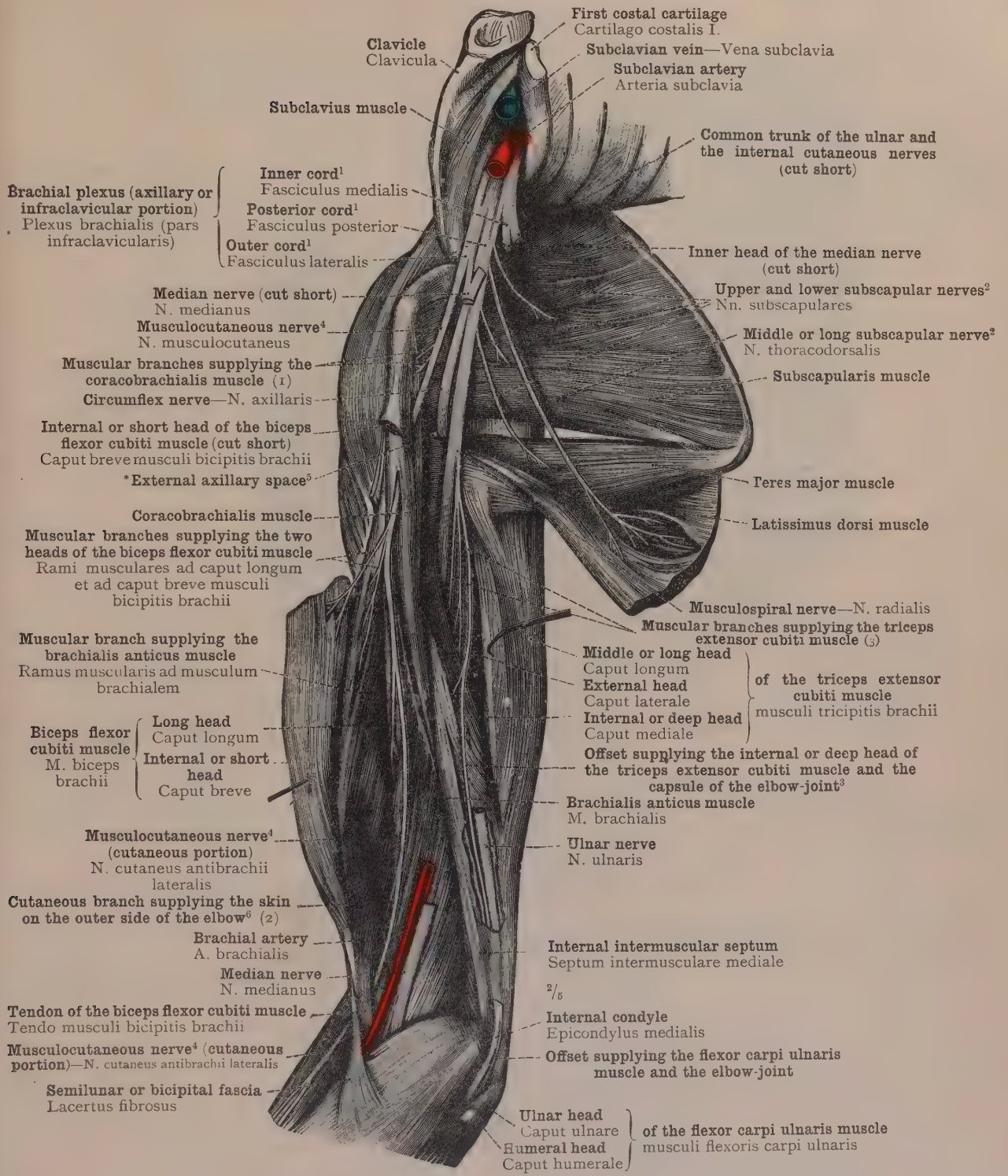


(1) Rami musculares nervi radialis ad caput mediale musculi tricipitis brachii

FIG. 1254.—THE DEEP NERVES OF THE SHOULDER AND THE UPPER ARM, SEEN FROM BEFORE AND THE INNER SIDE.

1 The communication between the brachial plexus and the intercostohumeral nerve is usually effected by means of a branch of the small internal cutaneous nerve (nerve of Wrisberg). 2 See Appendix, note 418.
3 See Appendix to Part V., note 308. 4 Sometimes called the *external cutaneous nerve*. 5 See Appendix, note 426.

Nerves of the Shoulder and the Upper Arm.


First costal cartilage
Cartilago costalis I.
Clavicle
Clavicula
Subclavian vein—Vena subclavia
Subclavian artery
Arteria subclavia
Subclavius muscle
Common trunk of the ulnar and the internal cutaneous nerves (cut short)
Brachial plexus (axillary or infraclavicular portion)
Plexus brachialis (pars infraclavicularis)
Inner cord[1]
Fasciculus medialis
Posterior cord[1]
Fasciculus posterior
Outer cord[1]
Fasciculus lateralis
Inner head of the median nerve (cut short)
Median nerve (cut short)
N. medianus
Upper and lower subscapular nerves[2]
Nn. subscapulares
Musculocutaneous nerve[4]
N. musculocutaneus
Middle or long subscapular nerve[2]
N. thoracodorsalis
Muscular branches supplying the coracobrachialis muscle (1)
Subscapularis muscle
Circumflex nerve—N. axillaris
Internal or short head of the biceps flexor cubiti muscle (cut short)
Caput breve musculi bicipitis brachii
*External axillary space[5]
Teres major muscle
Coracobrachialis muscle
Latissimus dorsi muscle
Muscular branches supplying the two heads of the biceps flexor cubiti muscle
Rami musculares ad caput longum et ad caput breve musculi bicipitis brachii
Musculospiral nerve—N. radialis
Muscular branches supplying the triceps extensor cubiti muscle (3)
Muscular branch supplying the brachialis anticus muscle
Ramus muscularis ad musculum brachialem
Middle or long head
Caput longum
External head
Caput laterale
Internal or deep head
Caput mediale
of the triceps extensor cubiti muscle
musculi tricipitis brachii
Biceps flexor cubiti muscle
M. biceps brachii
Long head
Caput longum
Internal or short head
Caput breve
Offset supplying the internal or deep head of the triceps extensor cubiti muscle and the capsule of the elbow-joint[3]
Brachialis anticus muscle
M. brachialis
Musculocutaneous nerve[4] (cutaneous portion)
N. cutaneus antibrachii lateralis
Ulnar nerve
N. ulnaris
Cutaneous branch supplying the skin on the outer side of the elbow[6] (2)
Brachial artery
A. brachialis
Internal intermuscular septum
Septum intermusculare mediale
Median nerve
N. medianus
2/5
Tendon of the biceps flexor cubiti muscle
Tendo musculi bicipitis brachii
Internal condyle
Epicondylus medialis
Musculocutaneous nerve[4] (cutaneous portion)—N. cutaneus antibrachii lateralis
Offset supplying the flexor carpi ulnaris muscle and the elbow-joint
Semilunar or bicipital fascia
Lacertus fibrosus
Ulnar head
Caput ulnare
Humeral head
Caput humerale
of the flexor carpi ulnaris muscle
musculi flexoris carpi ulnaris

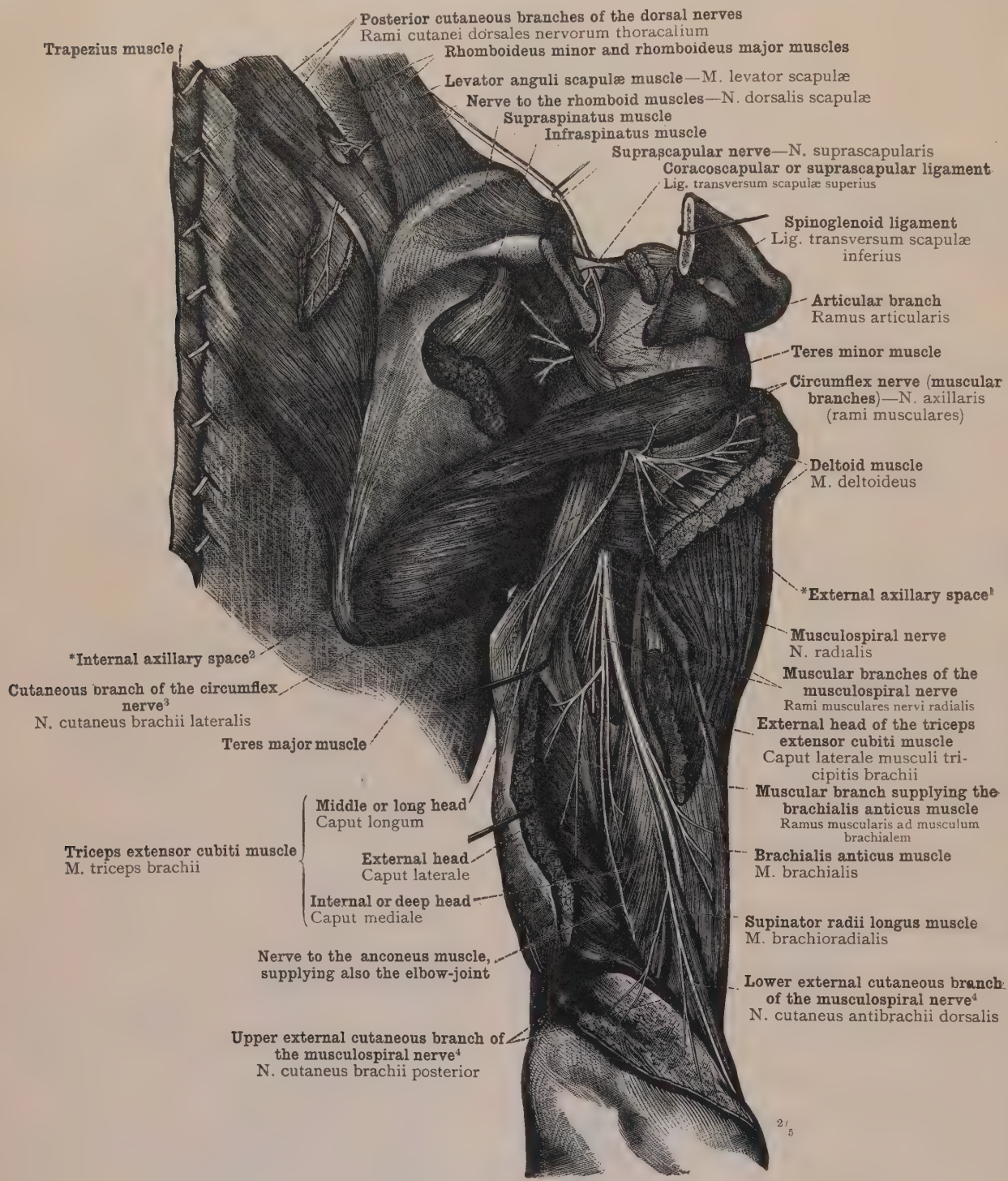
(1) Rami musculares ad musculum coracobrachialem (2) Ramus cutaneus (nervi cutanei antibrachii lateralis)
(3) Rami musculares ad musculum tricipitem brachii

1 See Appendix, note 426. 2 See Appendix, note 418. 3 See Appendix, note 427.
4 Sometimes called the *external cutaneous nerve*.
5 Called by Macalister the *quadrilateral space*. See note 1 to p. 312, in Part III. 6 See Appendix, note 428.

FIG. 1255.—THE DEEP NERVES OF THE SHOULDER AND THE UPPER ARM, SEEN FROM BEFORE AND THE INNER SIDE, AFTER REMOVING THE ULNAR AND MEDIAN NERVES.

The upper part of the internal or short head of the biceps flexor cubiti muscle was removed, while the lower part of the muscle was turned outwards, in order to display the nerves entering the biceps flexor cubiti and brachialis anticus muscles.

Nerves of the Shoulder and the Upper Arm.


Posterior cutaneous branches of the dorsal nerves
Rami cutanei dorsales nervorum thoracalium
Trapezius muscle
Rhomboideus minor and rhomboideus major muscles
Levator anguli scapulæ muscle—M. levator scapulæ
Nerve to the rhomboid muscles—N. dorsalis scapulæ
Supraspinatus muscle
Infraspinatus muscle
Suprascapular nerve—N. suprascapularis
Coracoscapular or suprascapular ligament
Lig. transversum scapulæ superius
Spinoglenoid ligament
Lig. transversum scapulæ inferius
Articular branch
Ramus articularis
Teres minor muscle
Circumflex nerve (muscular branches)—N. axillaris (rami musculares)
Deltoid muscle
M. deltoideus
*External axillary space[1]
Musculospiral nerve
N. radialis
Muscular branches of the musculospiral nerve
Rami musculares nervi radialis
External head of the triceps extensor cubiti muscle
Caput laterale musculi tricipitis brachii
Muscular branch supplying the brachialis anticus muscle
Ramus muscularis ad musculum brachialem
Brachialis anticus muscle
M. brachialis
Supinator radii longus muscle
M. brachioradialis
Lower external cutaneous branch of the musculospiral nerve[4]
N. cutaneus antibrachii dorsalis
*Internal axillary space[2]
Cutaneous branch of the circumflex nerve[3]
N. cutaneus brachii lateralis
Teres major muscle
Triceps extensor cubiti muscle
M. triceps brachii
Middle or long head
Caput longum
External head
Caput laterale
Internal or deep head
Caput mediale
Nerve to the anconeus muscle, supplying also the elbow-joint
Upper external cutaneous branch of the musculospiral nerve[4]
N. cutaneus brachii posterior
2/5

[1] Called by Macalister the *quadrilateral space*. See note [1] to p. 312, in Part III.
[2] Called by Macalister the *subscapular triangle*. See note [1] to p. 312, in Part III.
[3] Sometimes called the *lower branch of the circumflex nerve*, but the name used in the text is more distinctive.
[4] See Appendix, note 429.

FIG. 1256.—THE NERVES SUPPLYING THE MUSCLES OF THE SHOULDER-JOINT AND THE TRICEPS EXTENSOR CUBITI MUSCLE, ALSO THE CUTANEOUS OFFSETS OF THE CIRCUMFLEX AND MUSCULOSPIRAL NERVES, DISPLAYED FROM BEHIND. THE RAMIFICATION OF THE NERVE TO THE RHOMBOID MUSCLES (N. DORSALIS SCAPULÆ).

The spine of the scapula was sawn across, the detached segment was drawn outwards, and the supraspinatus and infraspinatus muscles were cut across. The external head of the triceps extensor cubiti muscle was divided by an oblique section, and the segments were drawn apart.

Nerves of the Shoulder and the Upper Arm.

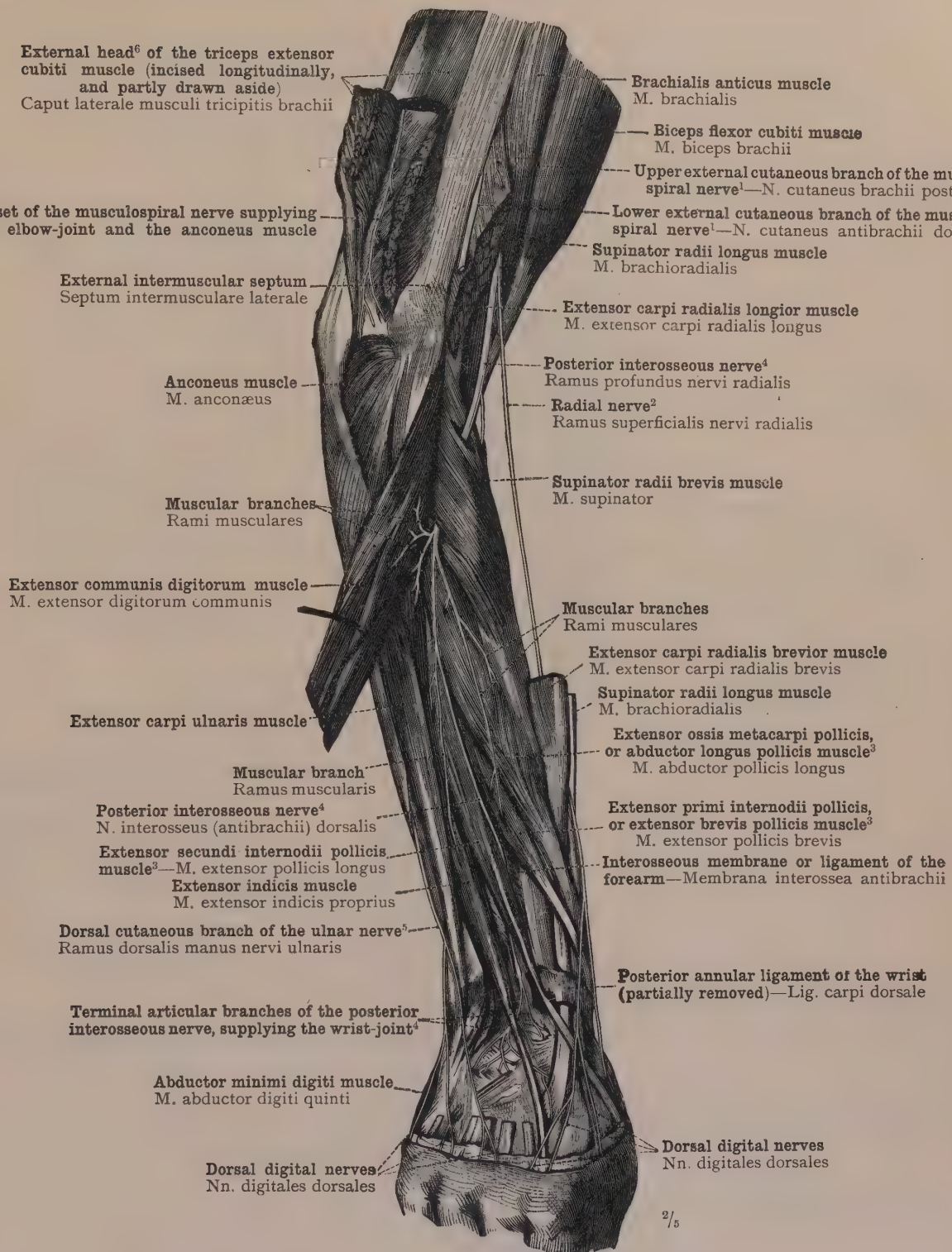

External head[6] of the triceps extensor cubiti muscle (incised longitudinally, and partly drawn aside)
Caput laterale musculi tricipitis brachii
Brachialis anticus muscle
M. brachialis
Biceps flexor cubiti muscle
M. biceps brachii
Upper external cutaneous branch of the musculospiral nerve[1]—N. cutaneus brachii posterior
Offset of the musculospiral nerve supplying the elbow-joint and the anconeus muscle
Lower external cutaneous branch of the musculospiral nerve[1]—N. cutaneus antibrachii dorsalis
Supinator radii longus muscle
M. brachioradialis
External intermuscular septum
Septum intermusculare laterale
Extensor carpi radialis longior muscle
M. extensor carpi radialis longus
Posterior interosseous nerve[4]
Ramus profundus nervi radialis
Anconeus muscle
M. anconæus
Radial nerve[2]
Ramus superficialis nervi radialis
Supinator radii brevis muscle
M. supinator
Muscular branches
Rami musculares
Extensor communis digitorum muscle
M. extensor digitorum communis
Muscular branches
Rami musculares
Extensor carpi radialis brevior muscle
M. extensor carpi radialis brevis
Supinator radii longus muscle
M. brachioradialis
Extensor carpi ulnaris muscle
Extensor ossis metacarpi pollicis, or abductor longus pollicis muscle[3]
M. abductor pollicis longus
Muscular branch
Ramus muscularis
Posterior interosseous nerve[4]
N. interosseus (antibrachii) dorsalis
Extensor primi internodii pollicis, or extensor brevis pollicis muscle[3]
M. extensor pollicis brevis
Extensor secundi internodii pollicis muscle[3]—M. extensor pollicis longus
Interosseous membrane or ligament of the forearm—Membrana interossea antibrachii
Extensor indicis muscle
M. extensor indicis proprius
Dorsal cutaneous branch of the ulnar nerve[5]
Ramus dorsalis manus nervi ulnaris
Posterior annular ligament of the wrist (partially removed)—Lig. carpi dorsale
Terminal articular branches of the posterior interosseous nerve, supplying the wrist-joint[4]
Abductor minimi digiti muscle
M. abductor digiti quinti
Dorsal digital nerves
Nn. digitales dorsales
Dorsal digital nerves
Nn. digitales dorsales
2/5

FIG. 1257.—THE DEEP NERVES OF THE DORSAL SIDE OF THE FOREARM. THE NERVE TO THE ANCONEUS MUSCLE (A BRANCH OF THE MUSCULOSPIRAL NERVE) AND THE BRANCHES OF THIS NERVE TO THE ELBOW-JOINT WERE EXPOSED BY AN INCISION INTO THE EXTERNAL HEAD[6] OF THE TRICEPS EXTENSOR CUBITI MUSCLE.

[1] See Appendix, note 429. [2] See Appendix, note 430. [3] See note [1] to p. 326, in Part III. [4] See Appendix, note 431.
[5] Also called *dorsal branch of the ulnar nerve* and *dorsal cutaneous nerve of the hand*, but both these names are less distinctive than that used in the text, which is employed by Macalister.
[6] See Appendix, note 432.

Nerves of the Forearm.

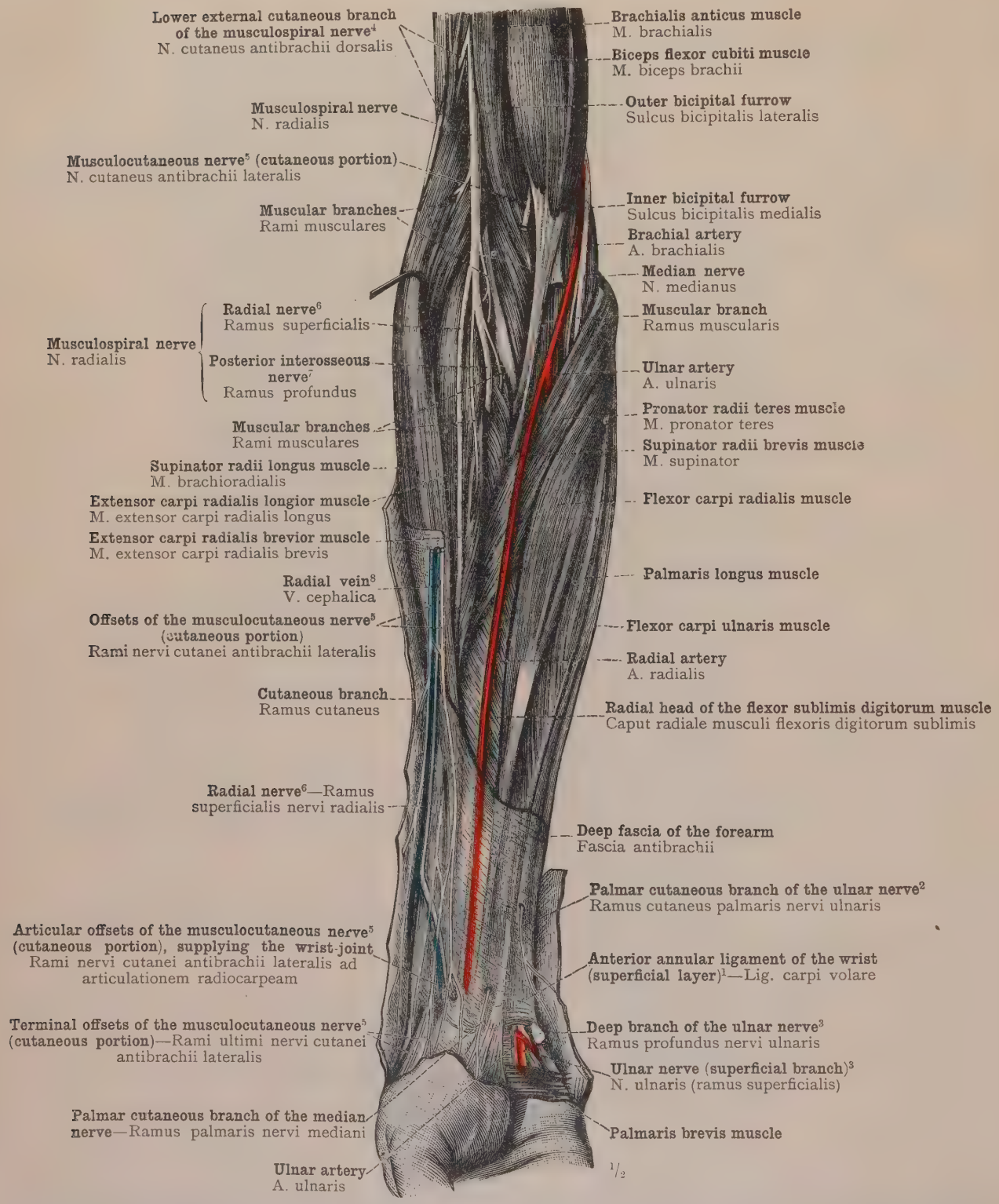
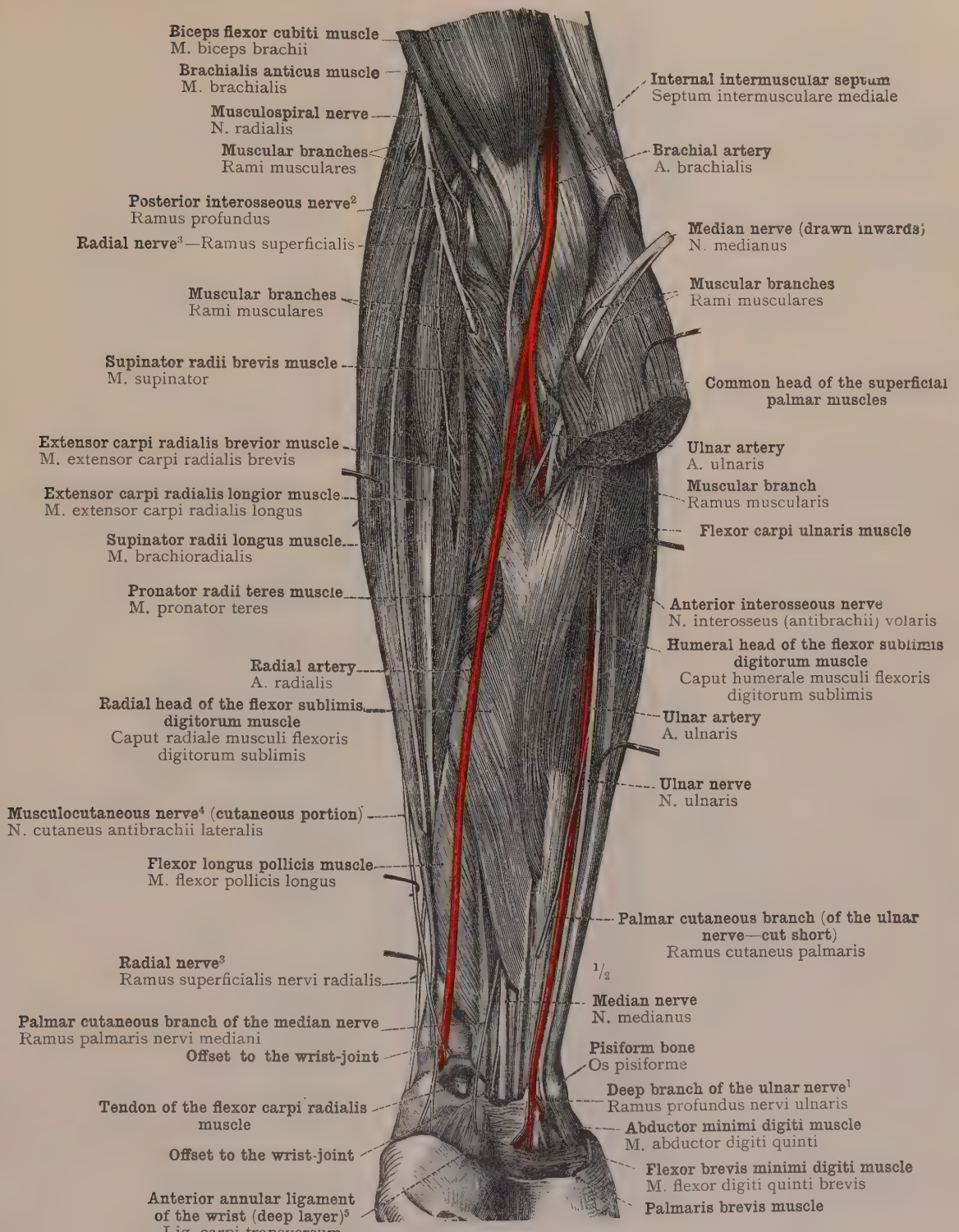


FIG. 1258.—THE DEEP NERVES OF THE PALMAR SIDE OF THE FOREARM, MORE ESPECIALLY THE COURSE AND DISTRIBUTION OF THE MUSCULOSPIRAL NERVE, DISPLAYED BY THE REMOVAL OF THE DEEP FASCIA OF THE FOREARM.

[1] See Appendix to Part V., note [214].
[2] In Ellis's "Demonstrations of Anatomy" this branch is called the *cutaneous nerve of the forearm and hand*—a name greatly lacking in precision.
[3] See Appendix, note [433]. [4] See Appendix, note [429]. [5] Sometimes called the *external cutaneous nerve.*
[6] See Appendix, note [439]. [7] See Appendix, note [431].
[8] Called by Macalister the *superficial radial vein.* With regard to the author's use of the term *vena cephalica*, see Appendix to Part V., note [395].

Nerves of the Forearm.

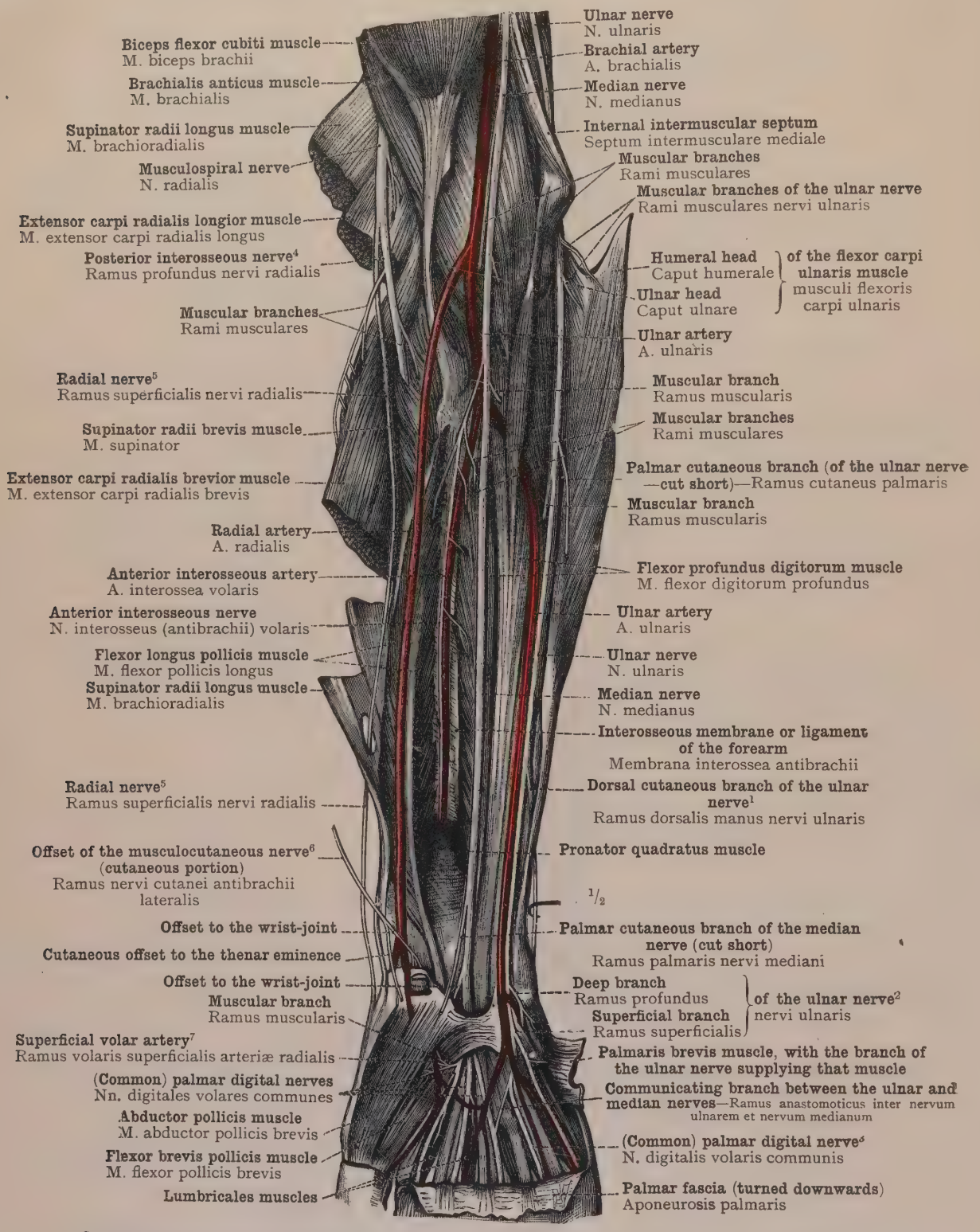


1 See Appendix, note 433. 2 See Appendix, note 431. 3 See Appendix, note 430.
4 Sometimes called the *external cutaneous nerve.* 5 See Appendix to Part V., note 214.

FIG. 1259.—THE DEEP NERVES OF THE PALMAR SIDE OF THE FOREARM, DISPLAYED BY THE PARTIAL REMOVAL OF THE PRONATOR RADII TERES, FLEXOR CARPI RADIALIS, AND PALMARIS LONGUS MUSCLES. THE PASSAGE OF THE MEDIAN NERVE BETWEEN THE TWO HEADS OF THE PRONATOR RADII TERES MUSCLE.

The muscles of the radial group (supinator and extensor muscles) have been separated a little one from another.

Nerves of the Forearm.

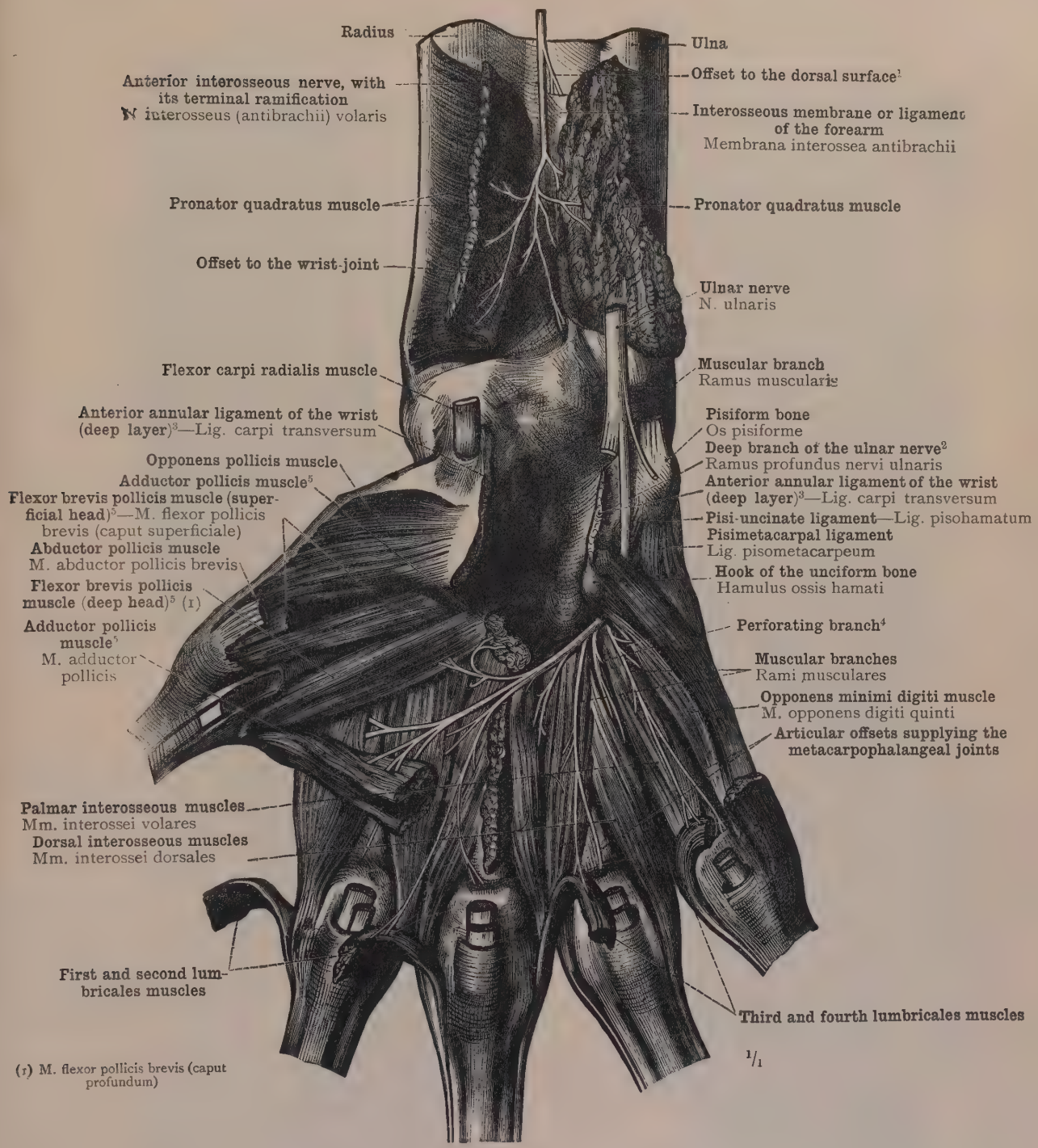


[1] See note 5 to p. 825. [2] See Appendix, note 433. [3] See Appendix, note 434. [4] See Appendix, note 431.
[5] See Appendix, note 430. [6] Sometimes called the *external cutaneous nerve.*
[7] Often known in England by the Latin name of *superficialis volæ artery.*

FIG. 1260.—THE DEEP NERVES OF THE PALMAR SIDE OF THE FOREARM, DISPLAYED BY THE REMOVAL OF THE FLEXOR SUBLIMIS DIGITORUM, SUPINATOR RADII LONGUS, EXTENSOR CARPI RADIALIS LONGIOR, AND EXTENSOR CARPI RADIALIS BREVIOR MUSCLES.

The flexor longus pollicis muscle has been drawn apart from the flexor profundus digitorum muscle.

Nerves of the Forearm.



[1] Not mentioned by Quain or Macalister. [2] See Appendix, note 433. [3] See Appendix to Part V., note 214.
[4] See Appendix, note 435. [5] See note [2] to p. 324, in Part III.

FIG. 1261.—THE TERMINAL RAMIFICATION OF THE ANTERIOR INTEROSSEOUS NERVE, N. INTEROSSEUS (ANTIBRACHII) VOLARIS, IN THE SUBSTANCE OF THE PRONATOR QUADRATUS MUSCLE, AND THE ARTICULAR BRANCH OF THIS NERVE TO THE WRIST-JOINT. THE DISTRIBUTION OF THE DEEP BRANCH OF THE ULNAR NERVE (*see Appendix, note* 433) TO THE MUSCLES OF THE METACARPUS AND TO THE METACARPOPHALANGEAL JOINTS.

The terminal ramification of the anterior interosseous nerve was exposed by making a vertical incision through the middle of the pronator quadratus muscle and drawing the segments apart. To expose the deep branch of the ulnar nerve in the palm of the hand, partial removal of the muscles of the thenar eminence was required.

Nerves of the Forearm and the Metacarpus.

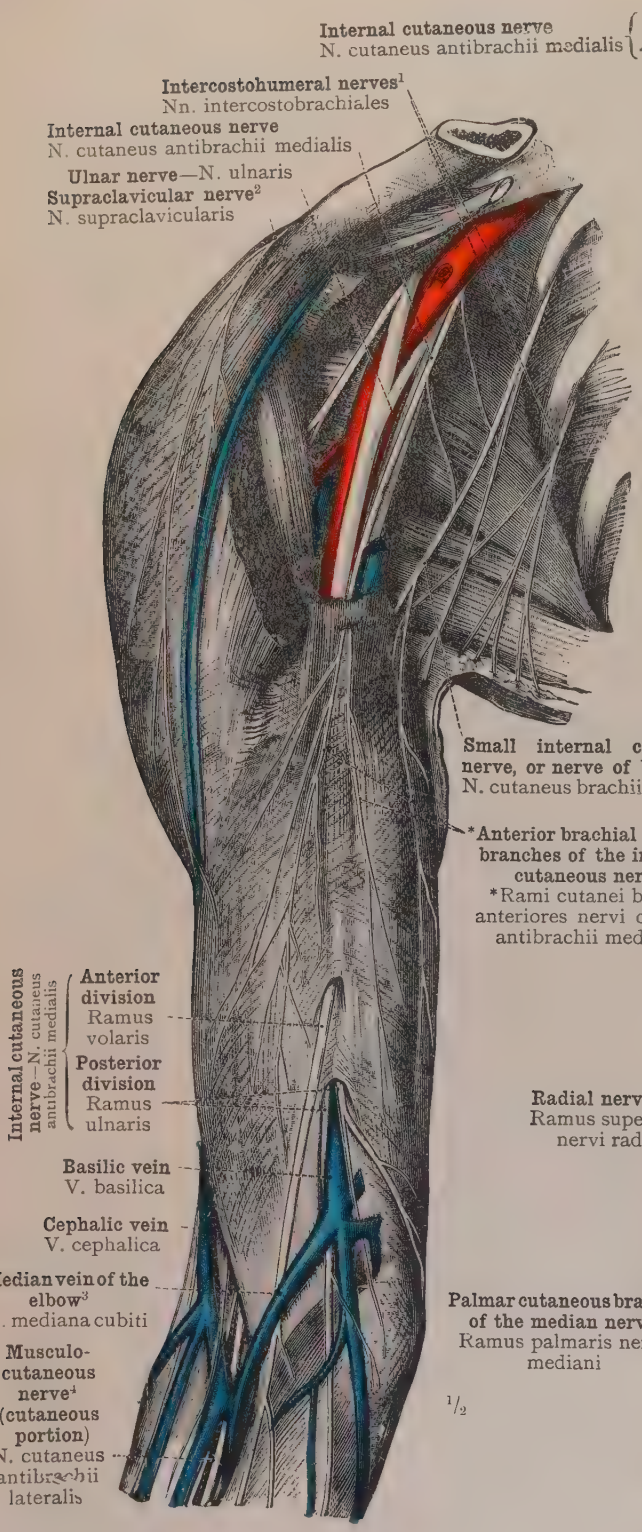


FIG. 1262.—THE CUTANEOUS NERVES OF THE ANTERIOR AND INNER SIDES OF THE UPPER ARM.

FIG. 1263.—THE CUTANEOUS NERVES OF THE PALMAR SURFACE OF THE FOREARM.

[1] See description at the foot of Fig. 1247, p. 815.
[2] See note [4] to p. 817.
[3] See Appendix to Part V., note 308.
[4] Sometimes called the *external cutaneous nerve*.
[5] See Appendix, note 430.
[6] See Appendix, note 436.

Cutaneous Nerves of the Upper Limb.

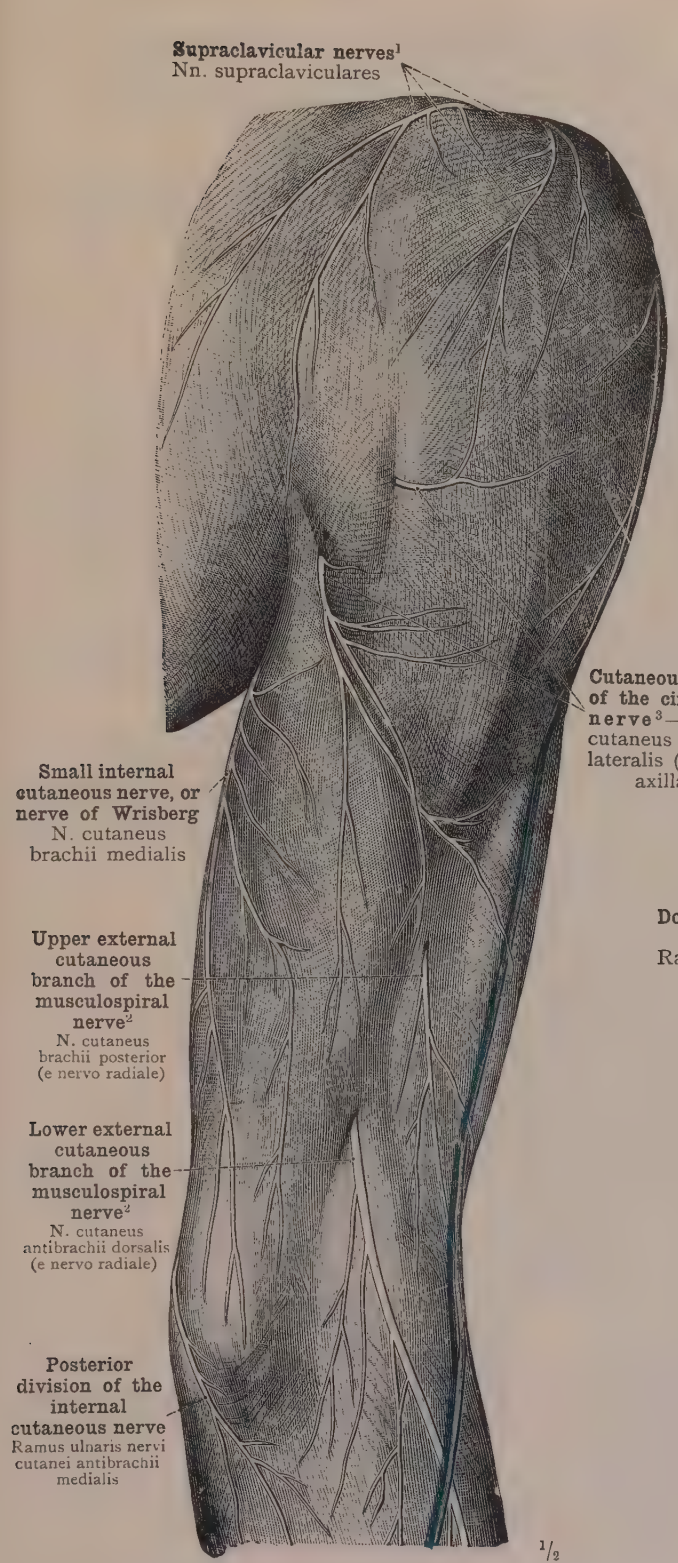

Supraclavicular nerves[1]
Nn. supraclaviculares
Small internal cutaneous nerve, or nerve of Wrisberg
N. cutaneus brachii medialis
Upper external cutaneous branch of the musculospiral nerve[2]
N. cutaneus brachii posterior (e nervo radiale)
Lower external cutaneous branch of the musculospiral nerve[2]
N. cutaneus antibrachii dorsalis (e nervo radiale)
Posterior division of the internal cutaneous nerve
Ramus ulnaris nervi cutanei antibrachii medialis
Cutaneous branch of the circumflex nerve[3]—Nervus cutaneus brachii lateralis (e nervo axillare)
1/2

FIG. 1264.—THE CUTANEOUS NERVES OF THE BACK OF THE UPPER ARM.

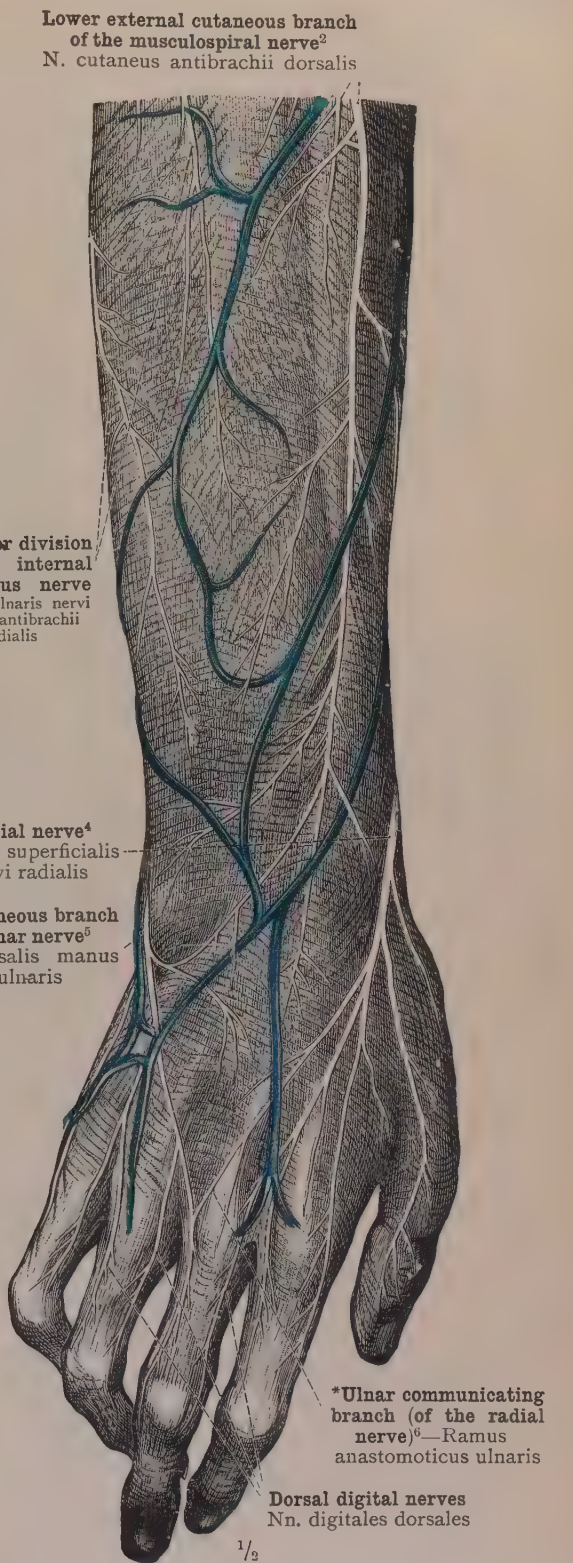

Lower external cutaneous branch of the musculospiral nerve[2]
N. cutaneus antibrachii dorsalis
Posterior division of the internal cutaneous nerve
Ramus ulnaris nervi cutanei antibrachii medialis
Radial nerve[4]
Ramus superficialis nervi radialis
Dorsal cutaneous branch of the ulnar nerve[5]
Ramus dorsalis manus nervi ulnaris
*Ulnar communicating branch (of the radial nerve)[6]—Ramus anastomoticus ulnaris
Dorsal digital nerves
Nn. digitales dorsales
1/2

FIG. 1265.—THE CUTANEOUS NERVES OF THE BACK OF THE FOREARM AND HAND.

[1] The hindmost of these nerves is distinguished as the *external* or *posterior branch* of the *supraclavicular nerves*, or as the *supra-acromial nerve*. See note [4] to p. 817.

[2] See Appendix, note 429. [3] Sometimes called the *lower branch of the circumflex nerve*, but the name used in the text is more distinctive.

[4] See Appendix, note 430. [5] See note [5] to p. 825. [6] See Appendix, note 437.

Cutaneous Nerves of the Upper Limb.

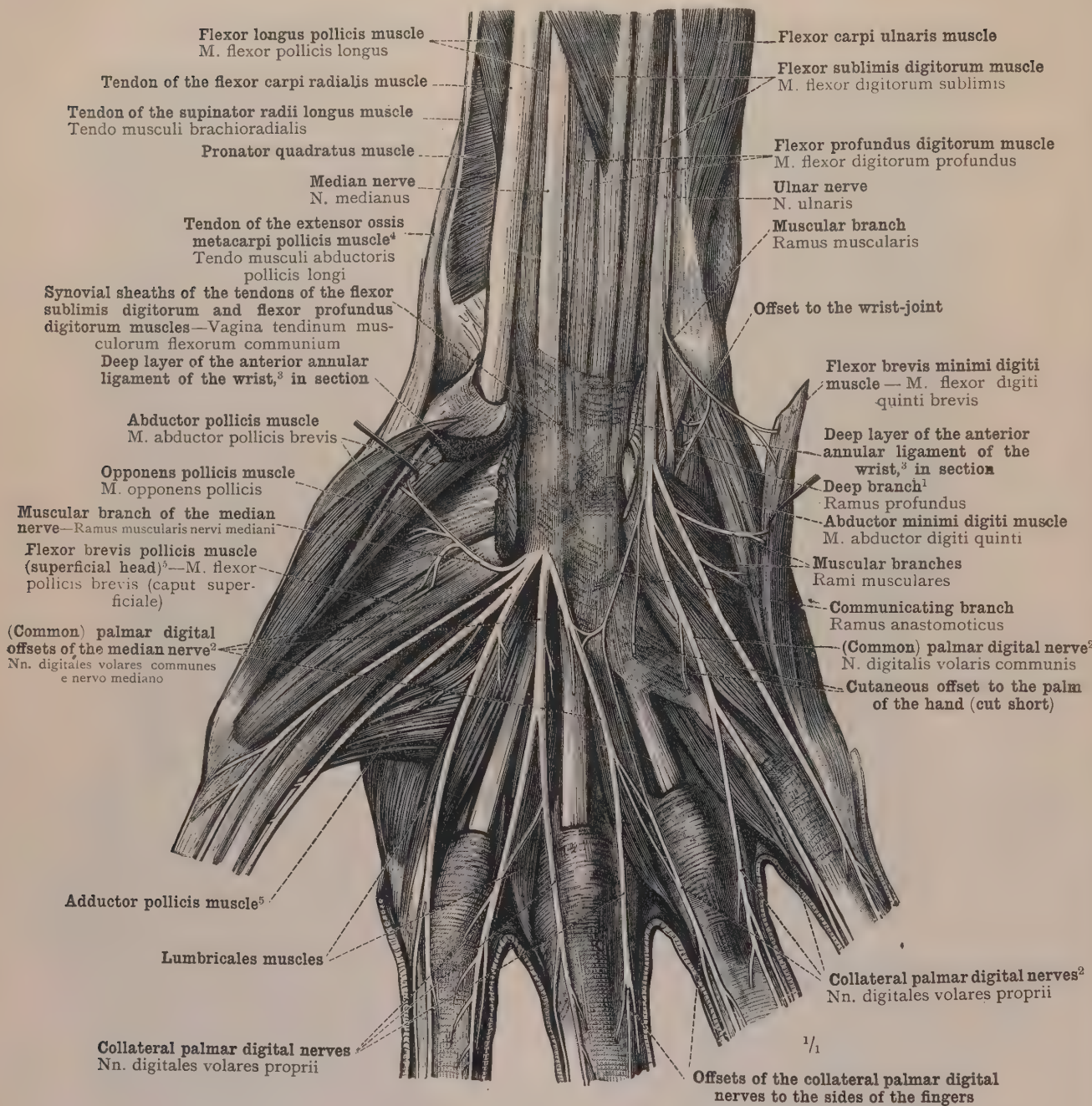

Flexor longus pollicis muscle
M. flexor pollicis longus
Tendon of the flexor carpi radialis muscle
Tendon of the supinator radii longus muscle
Tendo musculi brachioradialis
Pronator quadratus muscle
Median nerve
N. medianus
Tendon of the extensor ossis metacarpi pollicis muscle[4]
Tendo musculi abductoris pollicis longi
Synovial sheaths of the tendons of the flexor sublimis digitorum and flexor profundus digitorum muscles—Vagina tendinum musculorum flexorum communium
Deep layer of the anterior annular ligament of the wrist,[3] in section
Abductor pollicis muscle
M. abductor pollicis brevis
Opponens pollicis muscle
M. opponens pollicis
Muscular branch of the median nerve—Ramus muscularis nervi mediani
Flexor brevis pollicis muscle (superficial head)[5]—M. flexor pollicis brevis (caput superficiale)
(Common) palmar digital offsets of the median nerve[2]
Nn. digitales volares communes e nervo mediano
Adductor pollicis muscle[5]
Lumbricales muscles
Collateral palmar digital nerves
Nn. digitales volares proprii
Flexor carpi ulnaris muscle
Flexor sublimis digitorum muscle
M. flexor digitorum sublimis
Flexor profundus digitorum muscle
M. flexor digitorum profundus
Ulnar nerve
N. ulnaris
Muscular branch
Ramus muscularis
Offset to the wrist-joint
Flexor brevis minimi digiti muscle — M. flexor digiti quinti brevis
Deep layer of the anterior annular ligament of the wrist,[3] in section
Deep branch[1]
Ramus profundus
Abductor minimi digiti muscle
M. abductor digiti quinti
Muscular branches
Rami musculares
Communicating branch
Ramus anastomoticus
(Common) palmar digital nerve[2]
N. digitalis volaris communis
Cutaneous offset to the palm of the hand (cut short)
Collateral palmar digital nerves[2]
Nn. digitales volares proprii
1/1
Offsets of the collateral palmar digital nerves to the sides of the fingers

FIG. 1266.—THE DISTRIBUTION OF THE NERVES ON THE PALMAR SURFACE OF THE METACARPUS, DISPLAYED BY THE REMOVAL OF THE DEEP LAYER OF THE ANTERIOR ANNULAR LIGAMENT OF THE WRIST (LIGAMENTUM CARPI TRANSVERSUM—*see Appendix to Part V., note* [214]) AND THE PALMAR FASCIA (APONEUROSIS PALMARIS). THE PASSAGE OF THE MEDIAN NERVE (N. MEDIANUS) THROUGH THE CANAL OF THE CARPUS (CANALIS CARPI), IN WHICH THE NERVE IS IMBEDDED IN THE ANTERIOR WALL OF THE COMMON SYNOVIAL SHEATH OF THE FLEXOR TENDONS. THE PROXIMAL EXTREMITIES OF THE ABDUCTOR POLLICIS AND FLEXOR BREVIS MINIMI DIGITI MUSCLES HAVE BEEN CUT THROUGH, AND THE MUSCLES HAVE BEEN TURNED OUTWARDS AND INWARDS, RESPECTIVELY, IN ORDER TO DISPLAY THE MUSCULAR BRANCHES TO THE MUSCLES OF THE THENAR AND HYPOTHENAR EMINENCES.

[1] See Appendix, note 433.
[2] See Appendix, note 434.
[3] See Appendix to Part V., note [214].
[4] See note [1] to p. 326, in Part III.
[5] See note [2] to p. 324, in Part III.

Nerves of the Hand.

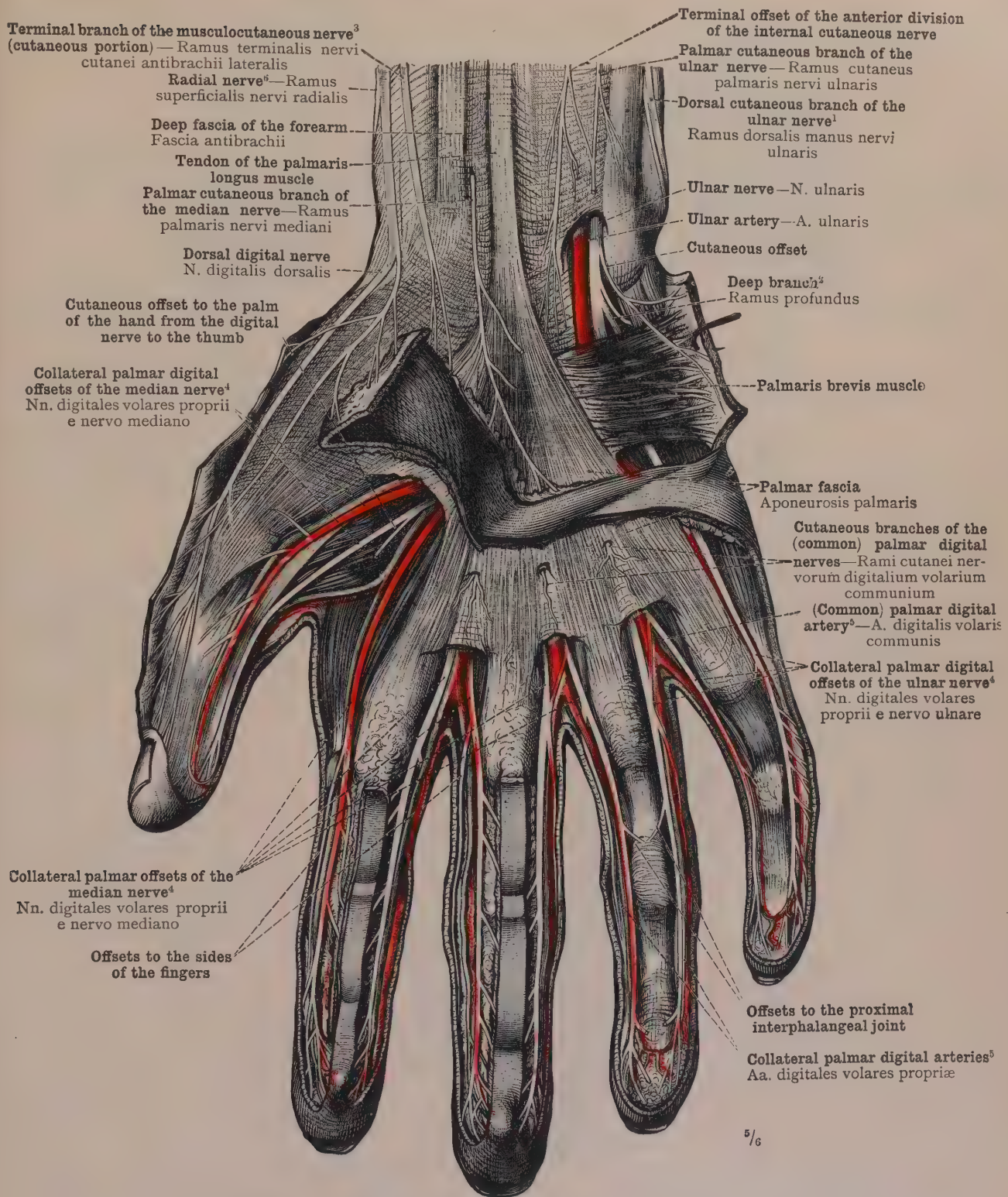

Terminal branch of the musculocutaneous nerve[3] (cutaneous portion)—Ramus terminalis nervi cutanei antibrachii lateralis
Radial nerve[6]—Ramus superficialis nervi radialis
Deep fascia of the forearm—Fascia antibrachii
Tendon of the palmaris longus muscle
Palmar cutaneous branch of the median nerve—Ramus palmaris nervi mediani
Dorsal digital nerve—N. digitalis dorsalis
Cutaneous offset to the palm of the hand from the digital nerve to the thumb
Collateral palmar digital offsets of the median nerve[4]—Nn. digitales volares proprii e nervo mediano
Collateral palmar offsets of the median nerve[4]—Nn. digitales volares proprii e nervo mediano
Offsets to the sides of the fingers
Terminal offset of the anterior division of the internal cutaneous nerve
Palmar cutaneous branch of the ulnar nerve—Ramus cutaneus palmaris nervi ulnaris
Dorsal cutaneous branch of the ulnar nerve[1]—Ramus dorsalis manus nervi ulnaris
Ulnar nerve—N. ulnaris
Ulnar artery—A. ulnaris
Cutaneous offset
Deep branch[2]—Ramus profundus
Palmaris brevis muscle
Palmar fascia—Aponeurosis palmaris
Cutaneous branches of the (common) palmar digital nerves—Rami cutanei nervorum digitalium volarium communium
(Common) palmar digital artery[5]—A. digitalis volaris communis
Collateral palmar digital offsets of the ulnar nerve[4]—Nn. digitales volares proprii e nervo ulnare
Offsets to the proximal interphalangeal joint
Collateral palmar digital arteries[5]—Aa. digitales volares propriæ
5/6

FIG. 1267.—THE SUPERFICIAL NERVES OF THE PALMAR SURFACE OF THE METACARPUS AND THE FINGERS.

1 See note 5 to p. 825.
2 See Appendix, note 433.
3 Sometimes called the *external cutaneous nerve.*
4 See Appendix, note 434.
5 See Appendix to Part V., note 213.
6 See Appendix, note 430.

Cutaneous Nerves of the Hand.

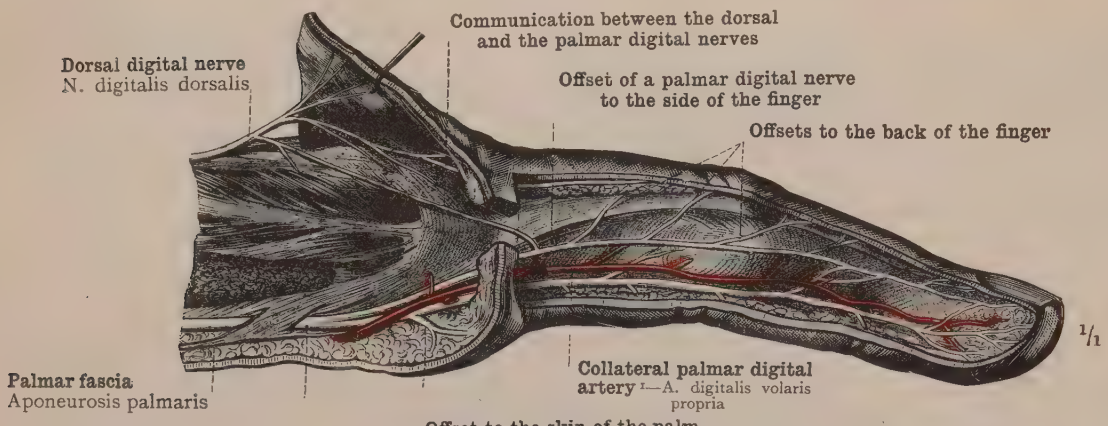

Communication between the dorsal and the palmar digital nerves
Dorsal digital nerve
N. digitalis dorsalis
Offset of a palmar digital nerve to the side of the finger
Offsets to the back of the finger
1/1
Palmar fascia
Aponeurosis palmaris
Collateral palmar digital artery [1]—A. digitalis volaris propria
Offset to the skin of the palm
Collateral palmar digital nerve[2]—N. digitalis volaris proprius

FIG. 1268.—THE PALMAR AND DORSAL NERVES OF THE RIGHT MIDDLE FINGER, SEEN FROM THE ULNAR SIDE.

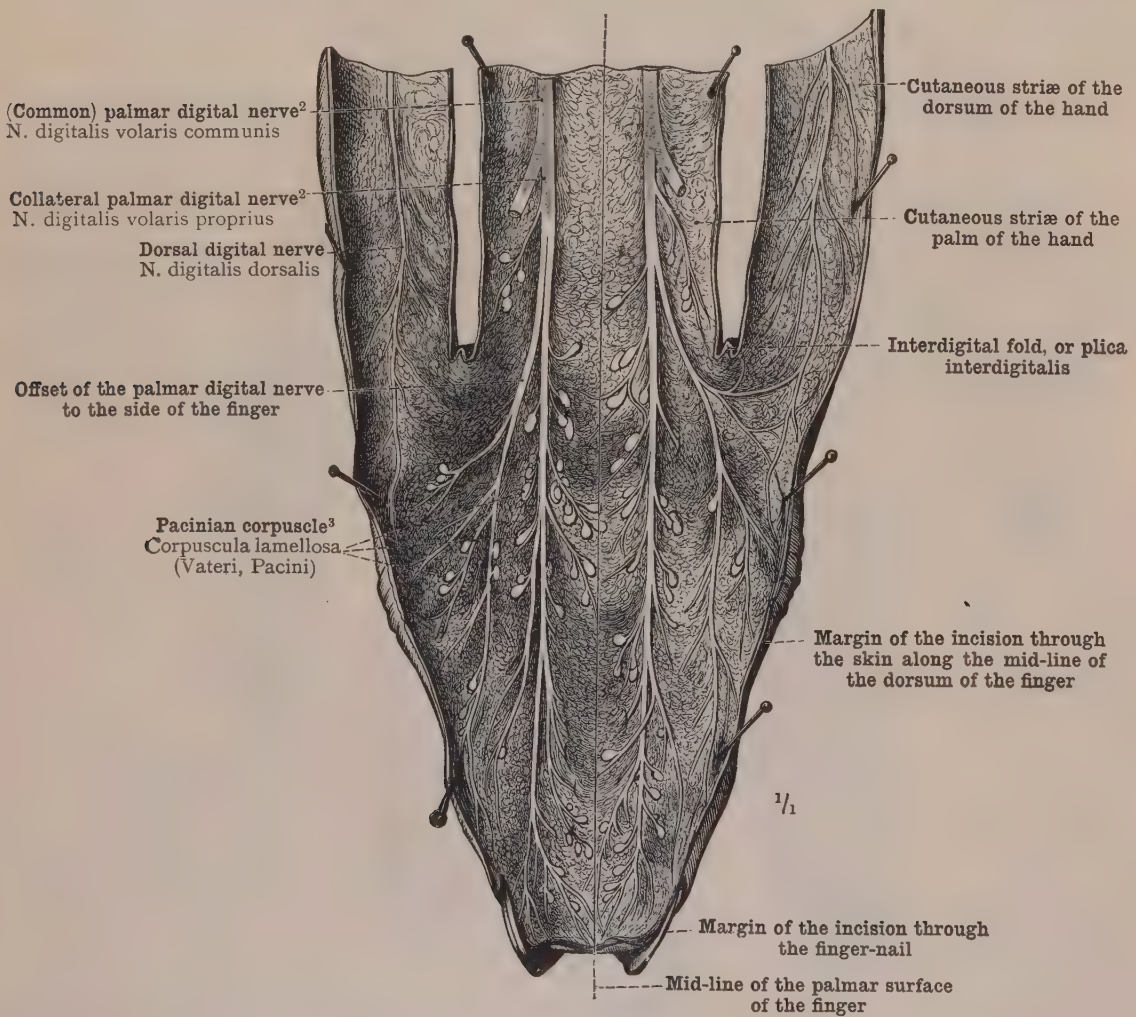

(Common) palmar digital nerve[2]
N. digitalis volaris communis
Collateral palmar digital nerve[2]
N. digitalis volaris proprius
Dorsal digital nerve
N. digitalis dorsalis
Offset of the palmar digital nerve to the side of the finger
Pacinian corpuscle[3]
Corpuscula lamellosa
(Vateri, Pacini)
Cutaneous striæ of the dorsum of the hand
Cutaneous striæ of the palm of the hand
Interdigital fold, or plica interdigitalis
Margin of the incision through the skin along the mid-line of the dorsum of the finger
1/1
Margin of the incision through the finger-nail
Mid-line of the palmar surface of the finger

FIG. 1269.—THE PALMAR AND DORSAL NERVES OF THE MIDDLE FINGER, AS SEEN IN THE DETACHED SKIN. PACINIAN CORPUSCLES (*see note* [3] *below*).

[1] See Appendix to Part V., note 213. [2] See Appendix, note 434.
[3] Called also *Pacinian body*, and sometimes *corpuscle of Vater*. See Appendix, note 385.

Cutaneous Nerves of the Hand.

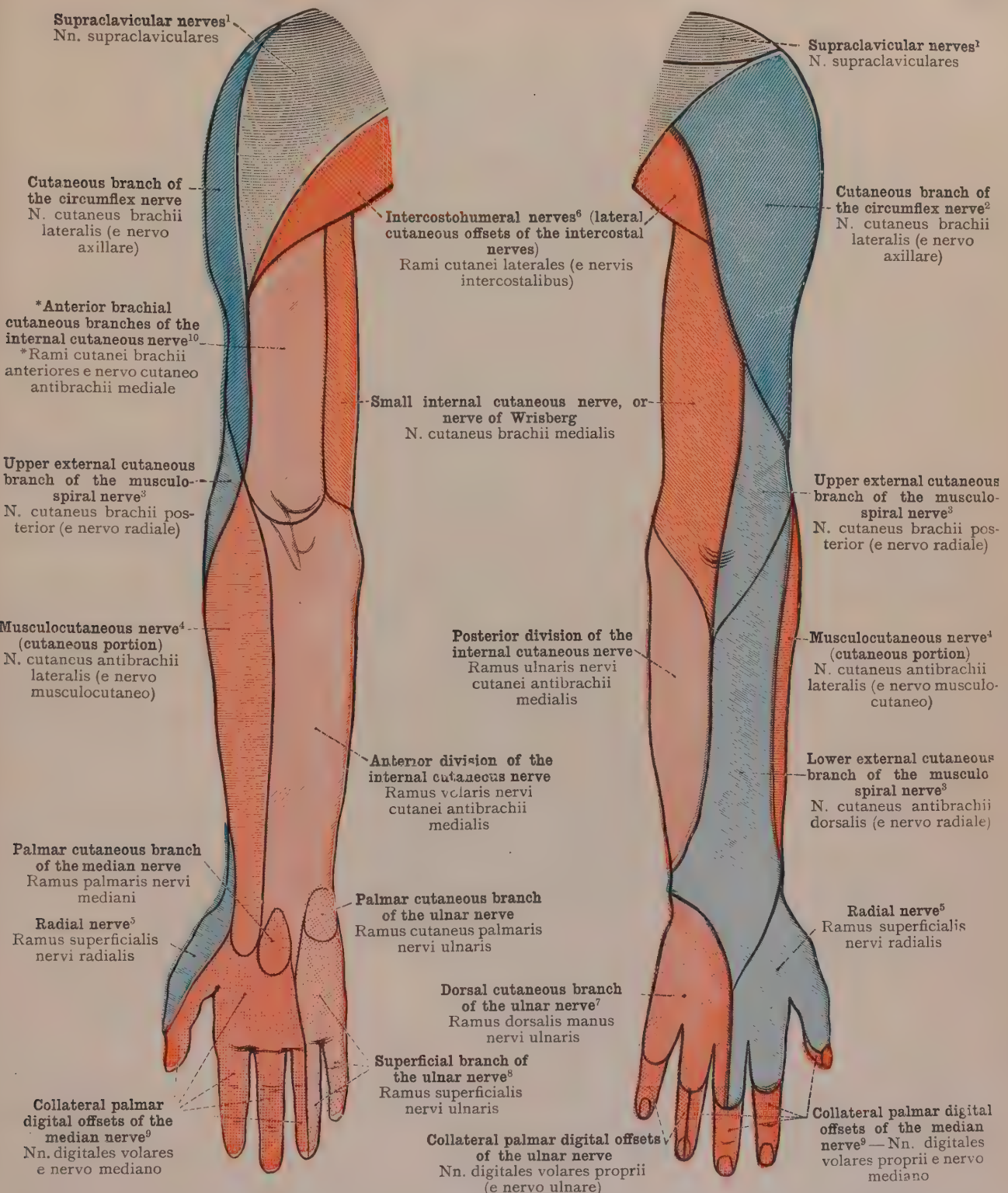

Supraclavicular nerves[1]
Nn. supraclaviculares
Cutaneous branch of the circumflex nerve
N. cutaneus brachii lateralis (e nervo axillare)
*Anterior brachial cutaneous branches of the internal cutaneous nerve[10]
*Rami cutanei brachii anteriores e nervo cutaneo antibrachii mediale
Upper external cutaneous branch of the musculospiral nerve[3]
N. cutaneus brachii posterior (e nervo radiale)
Musculocutaneous nerve[4] (cutaneous portion)
N. cutaneus antibrachii lateralis (e nervo musculocutaneo)
Palmar cutaneous branch of the median nerve
Ramus palmaris nervi mediani
Radial nerve[5]
Ramus superficialis nervi radialis
Collateral palmar digital offsets of the median nerve[9]
Nn. digitales volares e nervo mediano
Intercostohumeral nerves[6] (lateral cutaneous offsets of the intercostal nerves)
Rami cutanei laterales (e nervis intercostalibus)
Small internal cutaneous nerve, or nerve of Wrisberg
N. cutaneus brachii medialis
Posterior division of the internal cutaneous nerve
Ramus ulnaris nervi cutanei antibrachii medialis
Anterior division of the internal cutaneous nerve
Ramus volaris nervi cutanei antibrachii medialis
Palmar cutaneous branch of the ulnar nerve
Ramus cutaneus palmaris nervi ulnaris
Dorsal cutaneous branch of the ulnar nerve[7]
Ramus dorsalis manus nervi ulnaris
Superficial branch of the ulnar nerve[8]
Ramus superficialis nervi ulnaris
Collateral palmar digital offsets of the ulnar nerve
Nn. digitales volares proprii (e nervo ulnare)
Supraclavicular nerves[1]
N. supraclaviculares
Cutaneous branch of the circumflex nerve[2]
N. cutaneus brachii lateralis (e nervo axillare)
Upper external cutaneous branch of the musculospiral nerve[3]
N. cutaneus brachii posterior (e nervo radiale)
Musculocutaneous nerve[4] (cutaneous portion)
N. cutaneus antibrachii lateralis (e nervo musculocutaneo)
Lower external cutaneous branch of the musculospiral nerve[3]
N. cutaneus antibrachii dorsalis (e nervo radiale)
Radial nerve[5]
Ramus superficialis nervi radialis
Collateral palmar digital offsets of the median nerve[9]—Nn. digitales volares proprii e nervo mediano

FIG. 1270.—THE CUTANEOUS AREAS OF THE BRACHIAL NERVES ON THE ANTERIOR OR PALMAR SURFACE OF THE UPPER EXTREMITY.

FIG. 1271.—THE CUTANEOUS AREAS OF THE BRACHIAL NERVES ON THE POSTERIOR OR DORSAL SURFACE OF THE UPPER EXTREMITY.

[1] See note [4] to p. 817.
[2] Sometimes called the *lower branch of the circumflex nerve*, but the name used in the text is more distinctive.
[3] See Appendix, note 429.
[4] Sometimes called the *external cutaneous nerve*.
[5] See Appendix, note 430.
[6] See description at the foot of Fig. 1247, p. 815.
[7] See note [5] to p. 825.
[8] See Appendix, note 433.
[9] See Appendix, note 434.
[10] See Appendix, note 436.

Cutaneous Nerves of the Upper Limb.

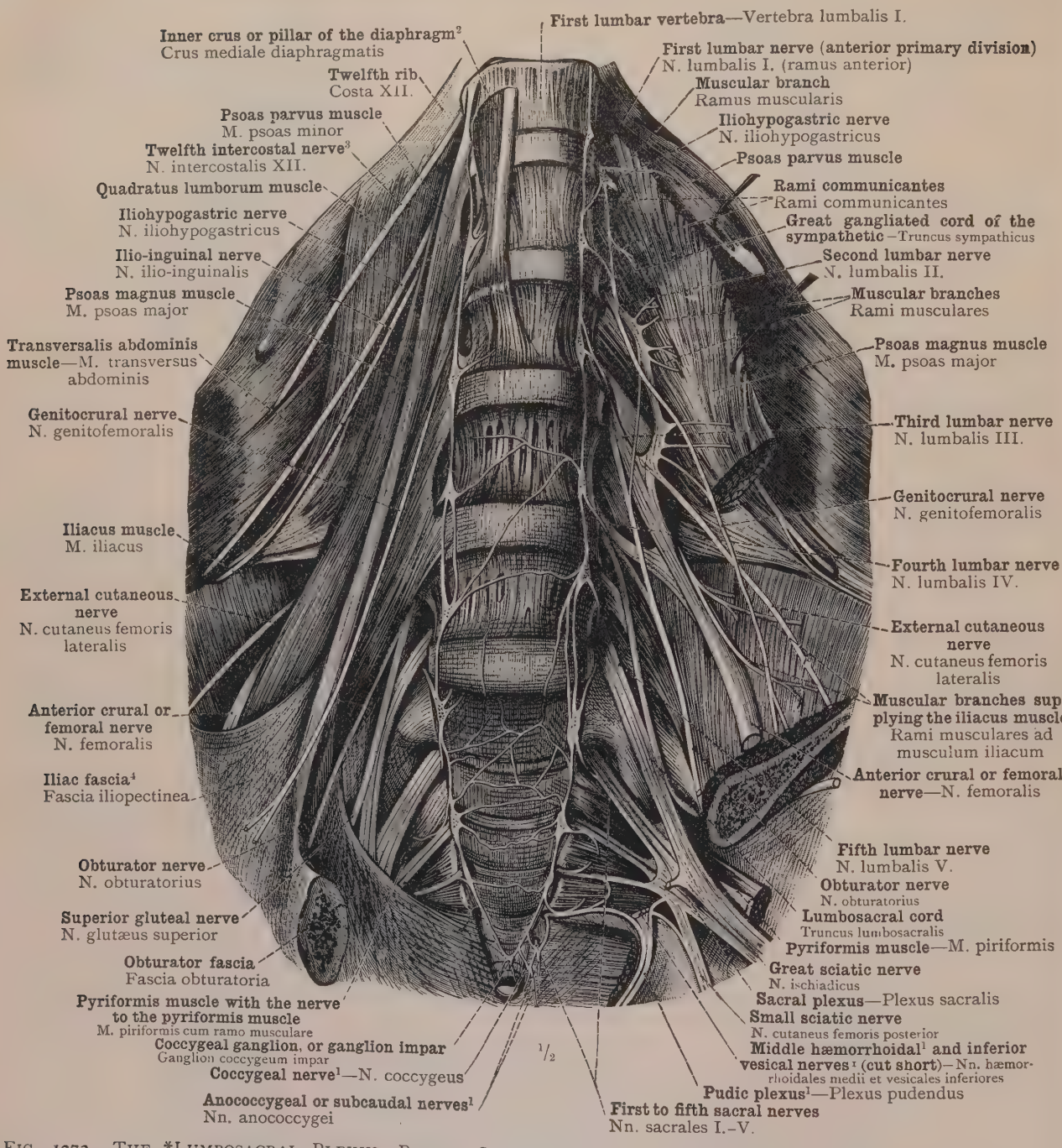


FIG. 1272.—THE *LUMBOSACRALIS, COMPRISING THE LUMBAR PLEXUS, PLEXUS LUMBALIS, THE SACRAL PLEXUS, PLEXUS SACRALIS, AND THE PUDIC PLEXUS, PLEXUS PUDENDUS (*see Appendix, note* [438]). THE FORMATION OF THE LUMBAR PLEXUS, PLEXUS LUMBALIS, OUT OF THE ANTERIOR PRIMARY DIVISIONS OF THE FIRST, SECOND, THIRD, AND PART OF THE FOURTH LUMBAR NERVES; THE JUNCTION OF THE REMAINING PORTION OF THE FOURTH LUMBAR NERVE (NERVUS FURCALIS) WITH THE FIFTH LUMBAR NERVE TO FORM THE LUMBOSACRAL CORD, TRUNCUS LUMBOSACRALIS. THE FORMATION OF THE SACRAL PLEXUS, PLEXUS SACRALIS (*see Appendix, note* [438]), OUT OF THE LUMBOSACRAL CORD AND THE ANTERIOR PRIMARY DIVISIONS OF THE FIRST, SECOND, AND THIRD SACRAL NERVES. THE FORMATION OF THE PUDIC PLEXUS, PLEXUS PUDENDUS, OUT OF PORTIONS OF THE THIRD, FOURTH, AND FIFTH SACRAL NERVES.

On the left side of the body the psoas magnus and psoas parvus muscles were detached from the bodies of the lumbar vertebræ, and the great sacrosciatic foramen, foramen ischiadicum majus, was opened from before by the removal of a large segment of the hip-bone.

[1] See Appendix, note [438].
[2] See note [1] to p. 286, in Part III.
[3] Sometimes distinguished as the *subcostal nerve.*
[4] See note [1] to p 390, in Part III.

*Plexus lumbosacralis—*Lumbosacral plexus.

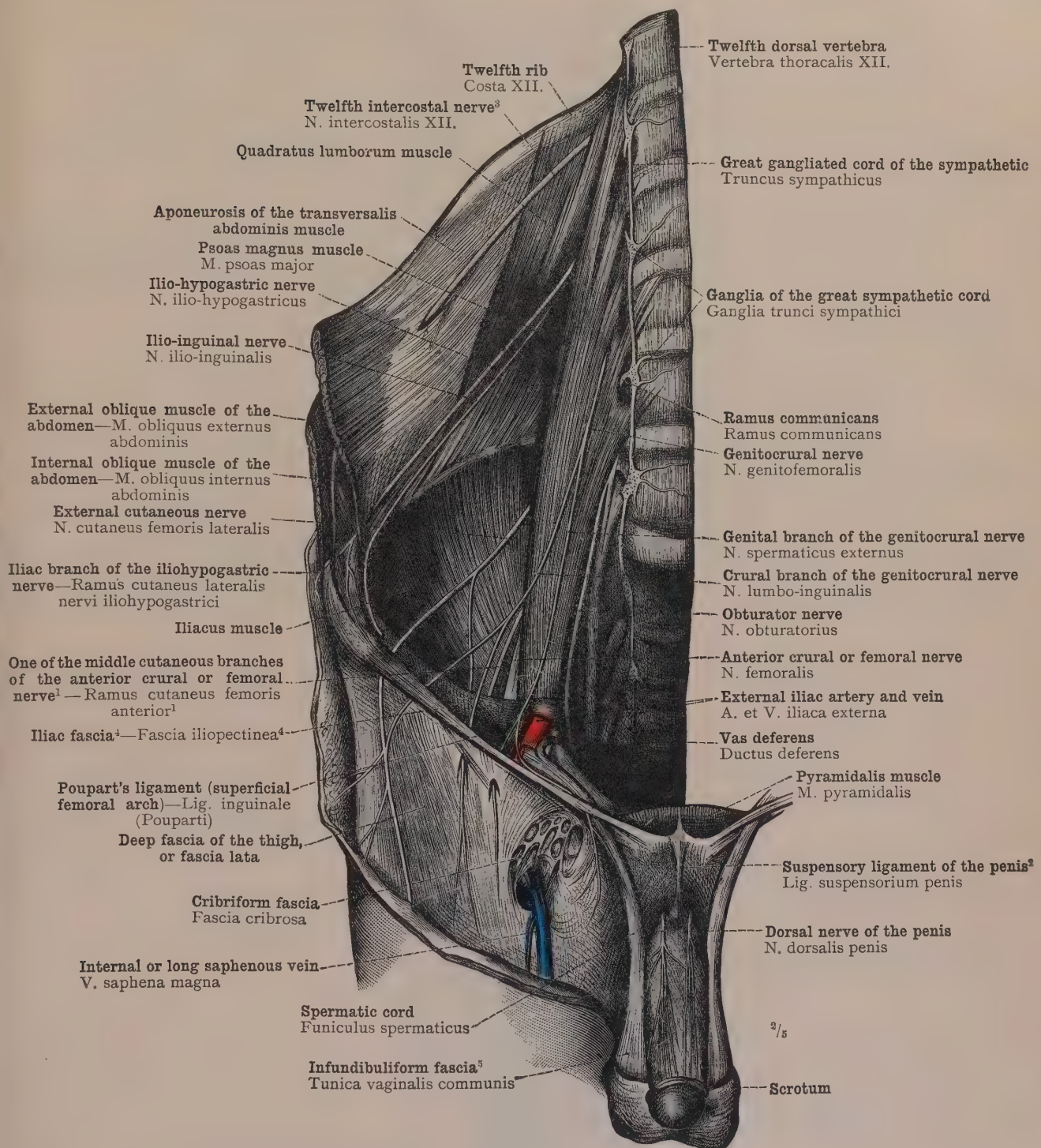


FIG. 1273.—THE NERVES ARISING FROM THE LUMBAR PLEXUS, AND THE PASSAGE OF THE GENITOCRURAL AND EXTERNAL CUTANEOUS NERVES (NN. GENITOFEMORALIS ET CUTANEUS FEMORIS LATERALIS) INTO THE THIGH. THE RAMIFICATION OF THE DORSAL NERVE OF THE PENIS (N. DORSALIS PENIS) ON THE DORSUM OF THE PENIS.

The ilio-inguinal nerve has been cut short just above the anterior superior spine of the ilium.

[1] See Appendix, note 439.

[2] Sometimes distinguished as the *true suspensory ligament of the penis*, or *deep part of the suspensory ligament* of the penis; in the author's nomenclature, however, the *false suspensory ligament of the penis*, or *superficial part of the suspensory ligament of the penis*, is designated *ligamentum fundiforme penis*. See note [2] to p. 382, in Part III.

[3] Sometimes distinguished as the *subcostal nerve*.

[4] See note [1] to p. 390, in Part III.

[5] See Appendix to Part IV., note [68].

Nerves of the Lumbar Plexus.

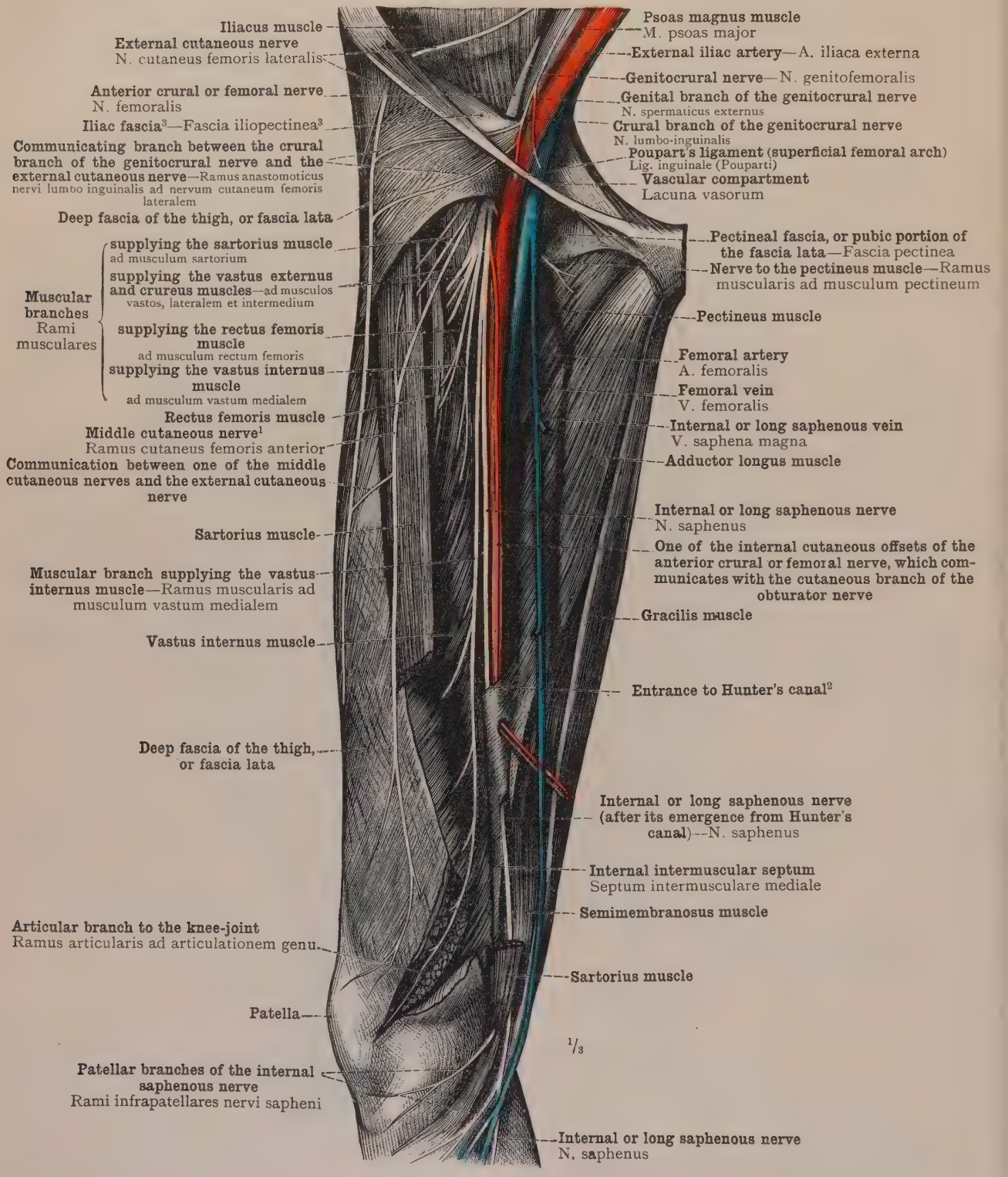

Iliacus muscle
External cutaneous nerve
N. cutaneus femoris lateralis
Anterior crural or femoral nerve
N. femoralis
Iliac fascia[3]—Fascia iliopectinea[3]
Communicating branch between the crural branch of the genitocrural nerve and the external cutaneous nerve—Ramus anastomoticus nervi lumbo inguinalis ad nervum cutaneum femoris lateralem
Deep fascia of the thigh, or fascia lata
Muscular branches Rami musculares
supplying the sartorius muscle
ad musculum sartorium
supplying the vastus externus and crureus muscles—ad musculos vastos, lateralem et intermedium
supplying the rectus femoris muscle
ad musculum rectum femoris
supplying the vastus internus muscle
ad musculum vastum medialem
Rectus femoris muscle
Middle cutaneous nerve[1]
Ramus cutaneus femoris anterior
Communication between one of the middle cutaneous nerves and the external cutaneous nerve
Sartorius muscle
Muscular branch supplying the vastus internus muscle—Ramus muscularis ad musculum vastum medialem
Vastus internus muscle
Deep fascia of the thigh, or fascia lata
Articular branch to the knee-joint
Ramus articularis ad articulationem genu
Patella
Patellar branches of the internal saphenous nerve
Rami infrapatellares nervi sapheni
Psoas magnus muscle
M. psoas major
External iliac artery—A. iliaca externa
Genitocrural nerve—N. genitofemoralis
Genital branch of the genitocrural nerve
N. spermaticus externus
Crural branch of the genitocrural nerve
N. lumbo-inguinalis
Poupart's ligament (superficial femoral arch)
Lig. inguinale (Pouparti)
Vascular compartment
Lacuna vasorum
Pectineal fascia, or pubic portion of the fascia lata—Fascia pectinea
Nerve to the pectineus muscle—Ramus muscularis ad musculum pectineum
Pectineus muscle
Femoral artery
A. femoralis
Femoral vein
V. femoralis
Internal or long saphenous vein
V. saphena magna
Adductor longus muscle
Internal or long saphenous nerve
N. saphenus
One of the internal cutaneous offsets of the anterior crural or femoral nerve, which communicates with the cutaneous branch of the obturator nerve
Gracilis muscle
Entrance to Hunter's canal[2]
Internal or long saphenous nerve (after its emergence from Hunter's canal)—N. saphenus
Internal intermuscular septum
Septum intermusculare mediale
Semimembranosus muscle
Sartorius muscle
1/3
Internal or long saphenous nerve
N. saphenus

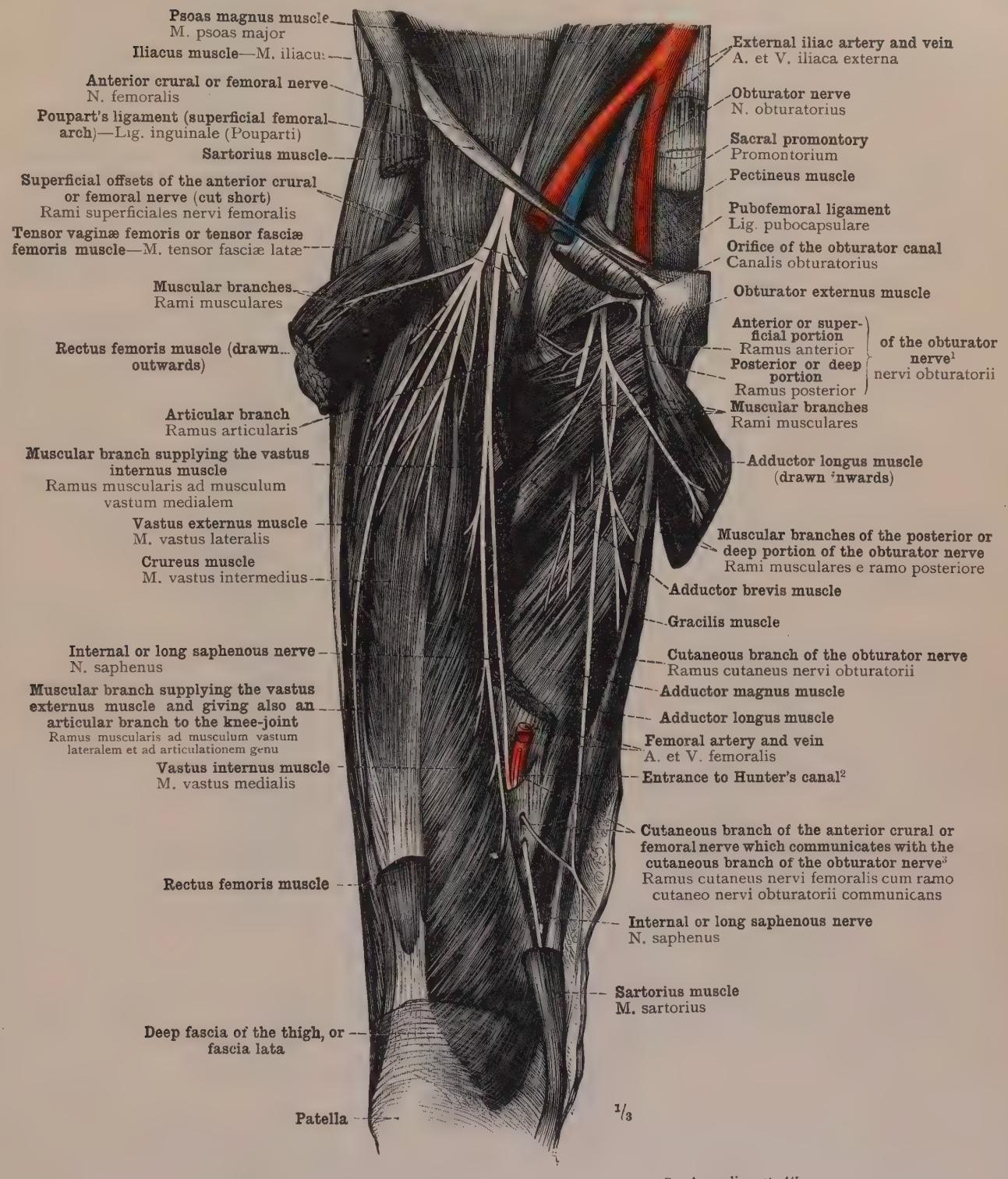
FIG. 1274.—THE DISTRIBUTION OF THE ANTERIOR CRURAL OR FEMORAL NERVE (N. FEMORALIS) ON THE FRONT OF THE THIGH, DISPLAYED BY THE PARTIAL REMOVAL OF THE SARTORIUS MUSCLE; THE ARTICULAR BRANCH TO THE KNEE-JOINT WAS EXPOSED BY MEANS OF AN INCISION IN THE VASTUS INTERNUS MUSCLE.

[1] See Appendix, note 439.

[2] According to English anatomists, the upper aperture of Hunter's canal (canalis adductorius Hunteri) is not at the point here shown, but much higher up in the thigh, at the apex of Scarpa's triangle. See Appendix to Part V., note 228.

[3] See note [1] to p. 390, in Part III.

The Deep Nerves of the Thigh.


Psoas magnus muscle
M. psoas major
Iliacus muscle—M. iliacus
Anterior crural or femoral nerve
N. femoralis
Poupart's ligament (superficial femoral arch)—Lig. inguinale (Pouparti)
Sartorius muscle
Superficial offsets of the anterior crural or femoral nerve (cut short)
Rami superficiales nervi femoralis
Tensor vaginæ femoris or tensor fasciæ femoris muscle—M. tensor fasciæ latæ
Muscular branches
Rami musculares
Rectus femoris muscle (drawn outwards)
Articular branch
Ramus articularis
Muscular branch supplying the vastus internus muscle
Ramus muscularis ad musculum vastum medialem
Vastus externus muscle
M. vastus lateralis
Crureus muscle
M. vastus intermedius
Internal or long saphenous nerve
N. saphenus
Muscular branch supplying the vastus externus muscle and giving also an articular branch to the knee-joint
Ramus muscularis ad musculum vastum lateralem et ad articulationem genu
Vastus internus muscle
M. vastus medialis
Rectus femoris muscle
Deep fascia of the thigh, or fascia lata
Patella
External iliac artery and vein
A. et V. iliaca externa
Obturator nerve
N. obturatorius
Sacral promontory
Promontorium
Pectineus muscle
Pubofemoral ligament
Lig. pubocapsulare
Orifice of the obturator canal
Canalis obturatorius
Obturator externus muscle
Anterior or superficial portion
Ramus anterior
Posterior or deep portion
Ramus posterior
of the obturator nerve[1]
nervi obturatorii
Muscular branches
Rami musculares
Adductor longus muscle (drawn inwards)
Muscular branches of the posterior or deep portion of the obturator nerve
Rami musculares e ramo posteriore
Adductor brevis muscle
Gracilis muscle
Cutaneous branch of the obturator nerve
Ramus cutaneus nervi obturatorii
Adductor magnus muscle
Adductor longus muscle
Femoral artery and vein
A. et V. femoralis
Entrance to Hunter's canal[2]
Cutaneous branch of the anterior crural or femoral nerve which communicates with the cutaneous branch of the obturator nerve[3]
Ramus cutaneus nervi femoralis cum ramo cutaneo nervi obturatorii communicans
Internal or long saphenous nerve
N. saphenus
Sartorius muscle
M. sartorius
1/3

[1] See Appendix, note 44o. [2] See note 2 to p. 838. [3] See Appendix, note 44r.

FIG. 1275.—THE DISTRIBUTION OF THE ANTERIOR CRURAL OR FEMORAL NERVE (NERVUS FEMORALIS) AND THE OBTURATOR NERVE (NERVUS OBTURATORIUS), DISPLAYED FROM BEFORE BY THE PARTIAL REMOVAL OF THE SARTORIUS, RECTUS FEMORIS, ADDUCTOR LONGUS, AND PECTINEUS MUSCLES.

The Deeper Nerves of the Thigh.

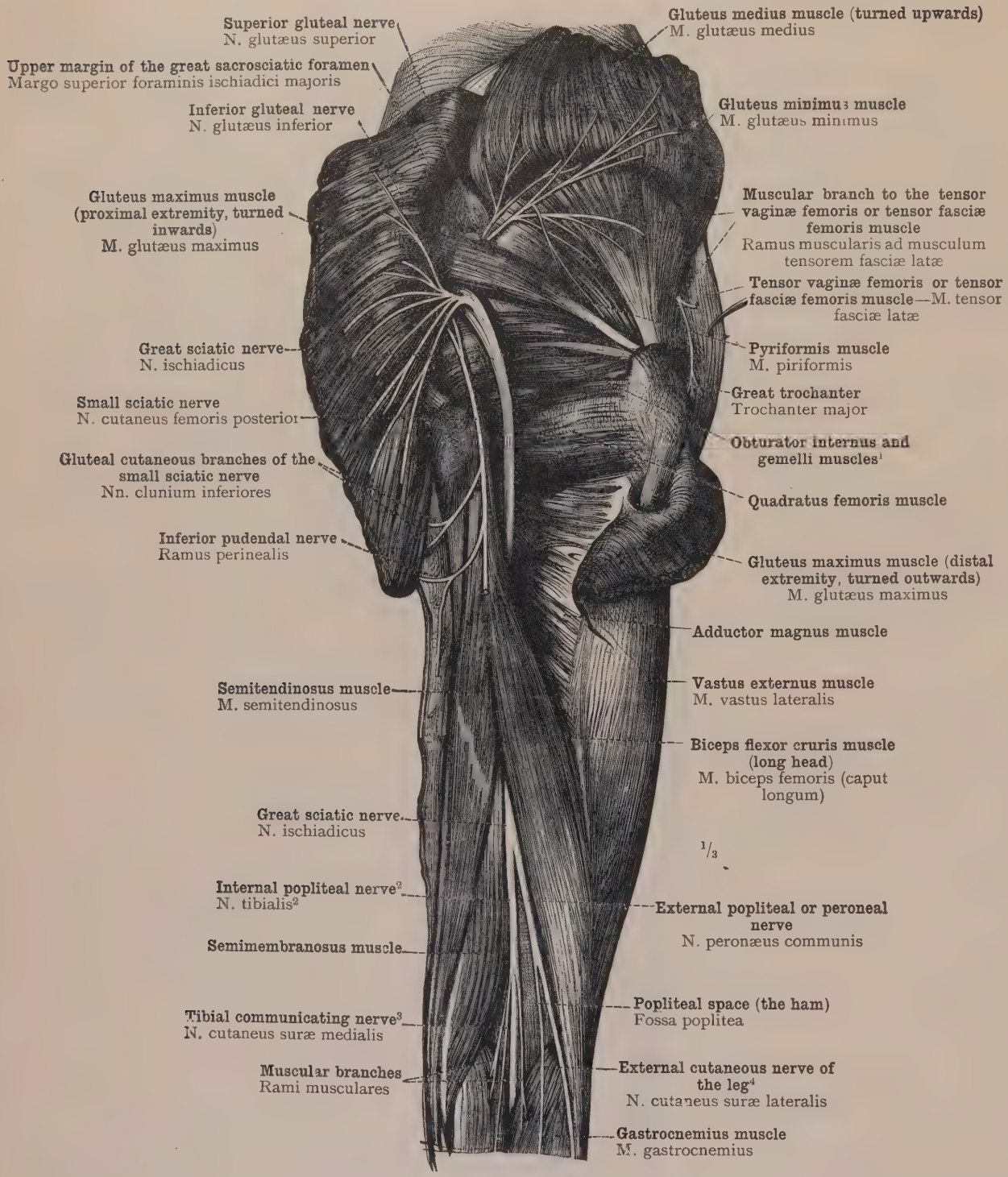
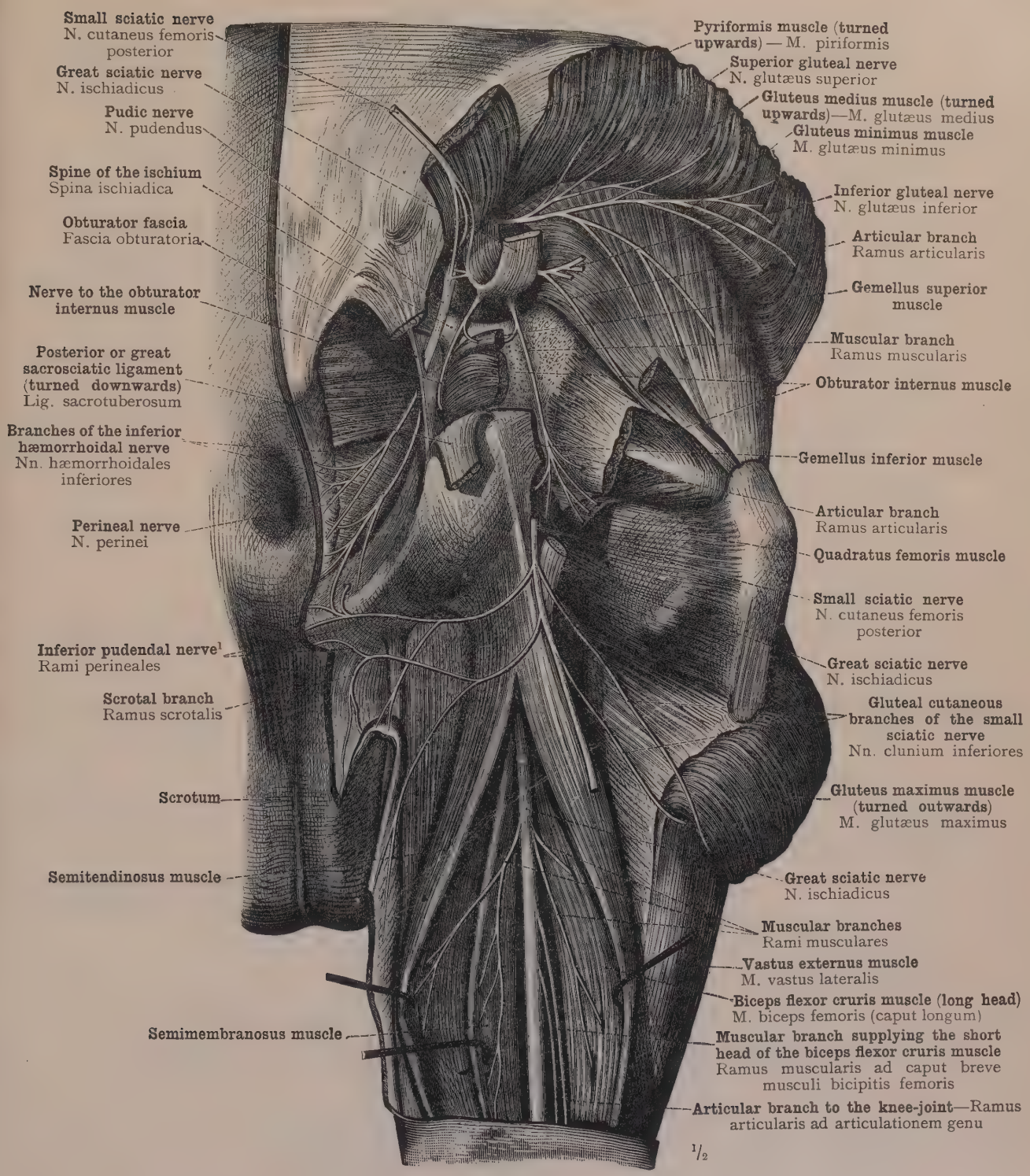


FIG. 1276.—THE SUPERIOR AND INFERIOR GLUTEAL NERVES, NN. GLUTÆI SUPERIOR ET INFERIOR, AND THEIR BRANCHES TO THE THREE GLUTEAL MUSCLES AND TO THE TENSOR VAGINÆ FEMORIS OR TENSOR FASCIÆ FEMORIS MUSCLE, M. TENSOR FASCIÆ LATÆ. THE COURSE OF THE GREAT SCIATIC NERVE, N. ISCHIADICUS, FROM THE GLUTEAL REGION DOWN THE BACK OF THE THIGH, AND ITS DIVISION INTO THE INTERNAL POPLITEAL NERVE (*see Appendix, note* 442), N. TIBIALIS, AND THE EXTERNAL POPLITEAL OR PERONEAL NERVE, N. PERONÆUS COMMUNIS.

The gluteus maximus and gluteus medius muscles have been cut across, the segments of the former muscle having been turned inwards and outwards, respectively, while the latter muscle, which was divided close to its insertion, has been turned upwards.

1 See note 1 to p. 340, in Part III. 2 See Appendix, note 442.
3 Sometimes known in England as the *communicans tibialis nerve*.
4 Quain calls this nerve the *lateral cutaneous nerve of the leg*, but gives no reason for departing from his ordinary usage of the word *external* to describe the relation in question.

The Deep Nerves of the Hip and the Thigh.



[1] See Appendix, note 443.

FIG. 1277.—THE NERVES SUPPLYING THE DEEP MUSCLES OF THE GLUTEAL REGION AND THE SKIN OF THE PERINEAL REGION. THE COURSE OF THE PUDIC NERVE, N. PUDENDUS, OVER THE SPINE OF THE ISCHIUM, SPINA ISCHIADICA, AND THROUGH THE OBTURATOR FASCIA INTO THE ISCHIORECTAL FOSSA.

The great and small sciatic nerves (nervus ischiadicus et nervus cutaneus femoris posterior) have been cut across and their proximal portions turned upwards. The posterior or great sacrosciatic ligament, ligamentum sacrotuberosum, has been cut across, and detached from the obturator fascia.

The Deep Nerves of the Hip and the Thigh.

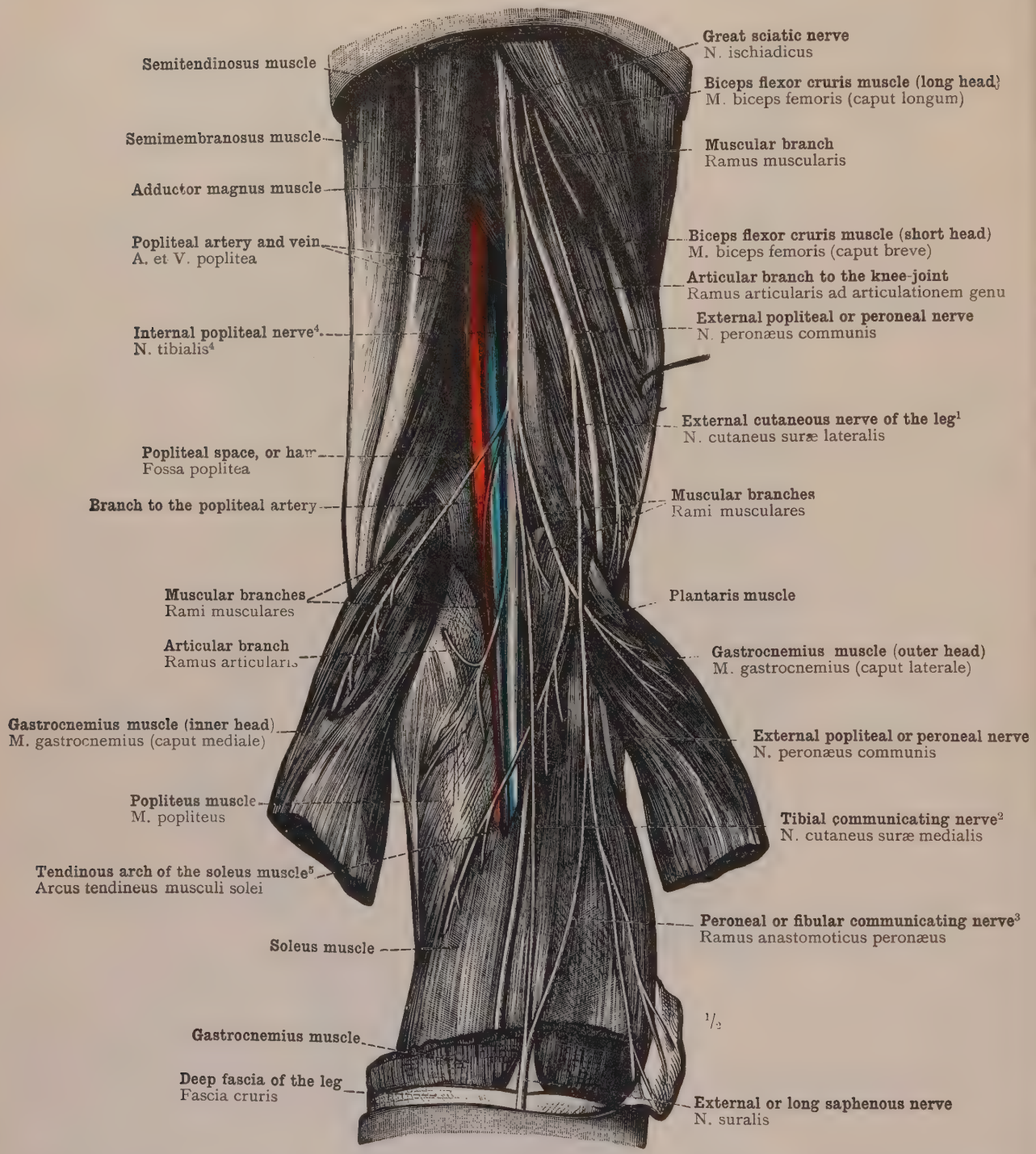
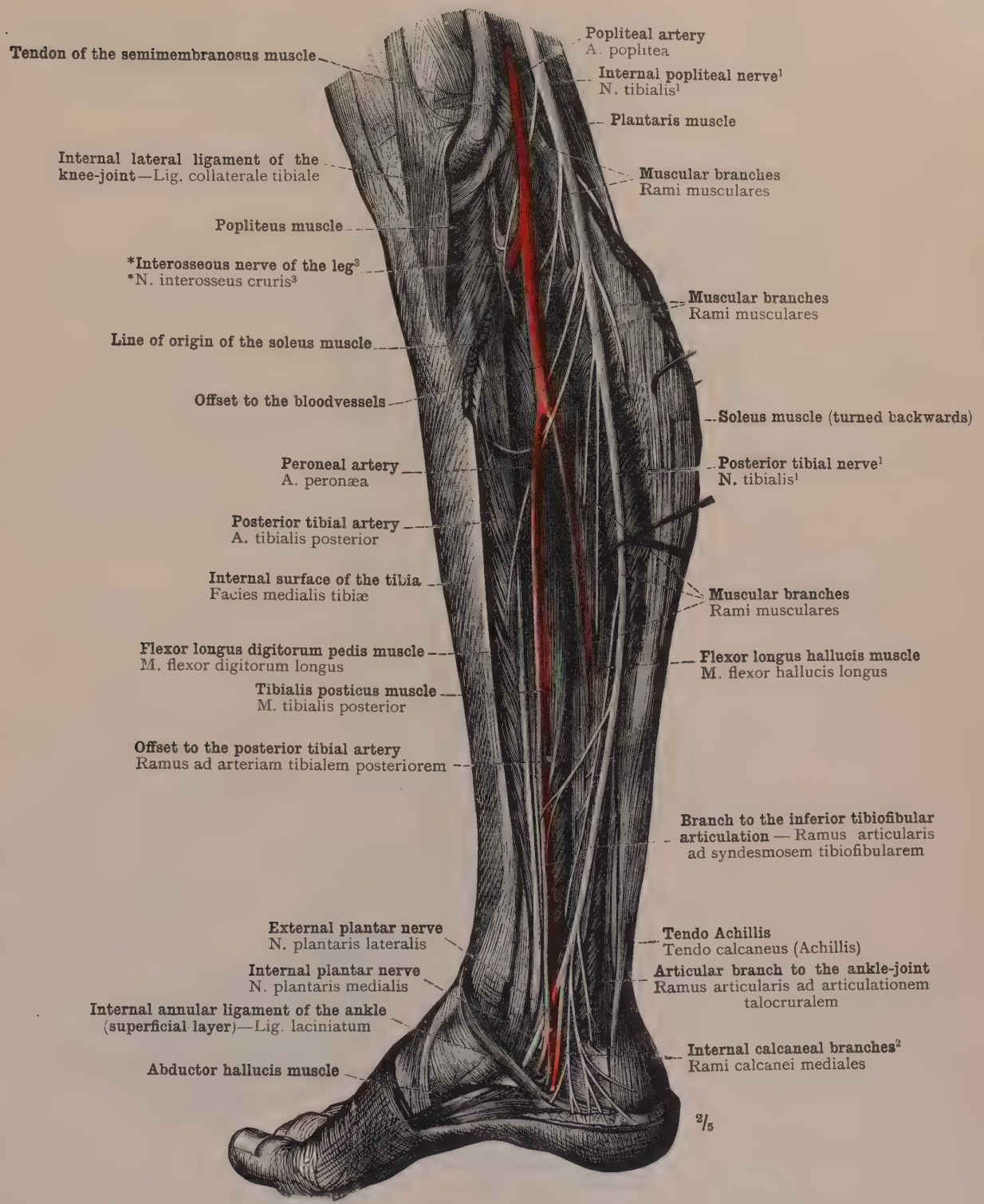


FIG. 1278.—DIVISION OF THE GREAT SCIATIC NERVE, N. ISCHIADICUS, INTO THE INTERNAL POPLITEAL NERVE, N. TIBIALIS (*see Appendix, note* 442), AND THE EXTERNAL POPLITEAL OR PERONEAL NERVE, N. PERONÆUS COMMUNIS. THE RELATIONS OF THE INTERNAL POPLITEAL NERVE TO THE POPLITEAL ARTERY AND VEIN, AND THE RELATIONS ALSO TO THESE VESSELS OF THE MUSCULAR BRANCHES GIVEN OFF IN THE POPLITEAL SPACE. THE EXTERNAL CUTANEOUS NERVE OF THE LEG, N. CUTANEUS SURÆ LATERALIS, GIVES OFF THE PERONEAL OR FIBULAR COMMUNICATING NERVE, RAMUS ANASTOMOTICUS PERONÆUS; FROM THE INTERNAL POPLITEAL NERVE IS DERIVED THE TIBIAL COMMUNICATING NERVE, N. CUTANEUS SURÆ MEDIALIS; THESE TWO COMMUNICATING NERVES UNITE, IN THIS SPECIMEN NEAR THE TOP OF THE CALF, TO FORM THE EXTERNAL SAPHENOUS NERVE, N. SURALIS.

The heads of the gastrocnemius muscle have been cut across and turned inwards and outwards respectively, thus exposing the popliteus, soleus, and plantaris muscles, as well as the tendon of the last-named muscle.

1 See note 4 to p. 840. 2 Sometimes known in England as the *communicans tibialis nerve.*
3 Sometimes known in England as the *communicans fibularis nerve.* 4 See Appendix, note 442. 5 See note 7 to p. 363, in Part III.

The Nerves arising in the Popliteal Space.



[1] See Appendix, note 442. [2] See Appendix, note 444. [3] See Appendix, note 445.

FIG. 1279.—THE BRANCHES OF THE INTERNAL POPLITEAL NERVE (N. TIBIALIS) AND ITS CONTINUATION, THE POSTERIOR TIBIAL NERVE (N. TIBIALIS—*see Appendix, note* 442), TO THE DEEP MUSCLES OF THE BACK OF THE LEG AND TO THE SKIN OF THE CALCANEAL REGION; THE DIVISION OF THE POSTERIOR TIBIAL NERVE INTO THE EXTERNAL AND INTERNAL PLANTAR NERVES (NN. PLANTARES, LATERALIS ET MEDIALIS). SEEN FROM THE INNER SIDE.

The soleus muscle has been detached from its tibial origin and turned backwards.

Nerves of the Leg.

External popliteal nerve
N. peronæus communis
Head of the fibula
Capitulum fibulæ
Musculocutaneous nerve
N. peronæus superficialis
Muscular branches
Rami musculares
Peroneus longus muscle (turned backwards)—M. peronæus longus
Anterior (peroneal) intermuscular septum
Septum intermusculare anterius (fibulare)
Peroneus brevis muscle
M. peronæus brevis
External and internal terminal branches of the musculocutaneous nerve—Rami cutanei nervi peronæi superficialis
Deep fascia of the leg
Fascia cruris
External or short saphenous nerve—N. suralis
Tendo Achillis—Tendo calcaneus (Achillis)
External calcaneal branches
Rami calcanei laterales
Terminal portion of the external or short saphenous nerve
N. cutaneus dorsalis lateralis
Dorsal digital nerves of the foot
Nn. digitales dorsales pedis
Peroneus longus muscle (proximal extremity, turned upwards)—M. peronæus longus
Muscular branches
Rami musculares
Anterior tibial nerve
N. peronæus profundus
Muscular branch
Ramus muscularis
Extensor longus digitorum pedis muscle (cut across)—M. extensor digitorum longus
Tibialis anticus muscle
M. tibialis anterior
Anterior tibial nerve
N. peronæus profundus
Extensor longus vel extensor proprius hallucis muscle[1]—M. extensor hallucis longus
Peroneus tertius muscle
M. peronæus tertius
Extensor longus digitorum pedis muscle (distal portion)—M. extensor digitorum longus
Musculocutaneous nerve, external and internal terminal branches, emerging from beneath the deep fascia of the leg
N. peronæus superficialis (rami cutanei)
Internal terminal branch of the musculocutaneous nerve
N. cutaneus dorsalis medialis
External terminal branch of the musculocutaneous nerve—N. cutaneus dorsalis intermedius
Internal terminal branch of the anterior tibial nerve—Portio ultima nervi peronæi profundi
Dorsal digital nerves of the outer side of the great toe and the inner side of the second toe (1)
2/5

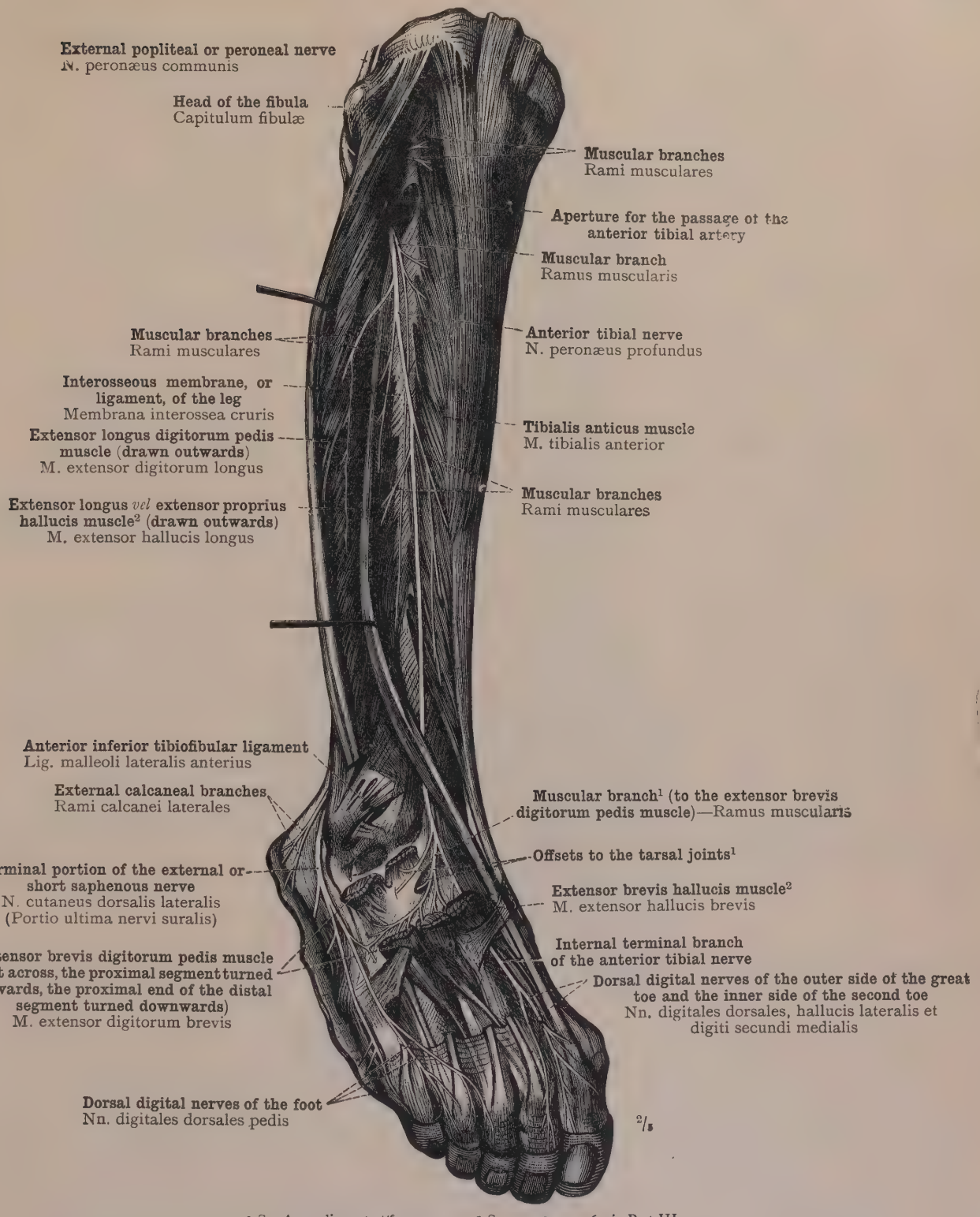
(1) Nn. digitales dorsales, hallucis lateralis et digiti II. medialis

[1] See note [2] to p. 364, in Part III.

FIG. 1280.—THE DISTRIBUTION OF THE EXTERNAL POPLITEAL OR PERONEAL NERVE, ITS BRANCHES TO THE PERONEUS LONGUS AND PERONEUS BREVIS MUSCLES, AND ITS CUTANEOUS BRANCH TO THE DORSUM OF THE FOOT, THE MUSCULOCUTANEOUS NERVE, N. PERONÆUS SUPERFICIALIS, WHICH DIVIDES (IN THIS SPECIMEN) A LITTLE BELOW THE KNEE INTO EXTERNAL AND INTERNAL TERMINAL BRANCHES. NN. CUTANEI DORSALES, MEDIALIS ET INTERMEDIUS. THE DISTRIBUTION OF THESE TWO CUTANEOUS NERVES AND OF THE EXTERNAL OR SHORT SAPHENOUS NERVE, N. SURALIS, THE TERMINAL PORTION OF WHICH (AS THE N. CUTANEUS DORSALIS LATERALIS) SUPPLIES THE SKIN OF THE OUTER SIDE OF THE DORSUM OF THE FOOT. THE INTERNAL TERMINAL BRANCH OF THE ANTERIOR TIBIAL NERVE, SUPPLYING THE ADJACENT SIDES OF THE FIRST AND SECOND TOES, IS ALSO SEEN. VIEWED FROM THE OUTER SIDE.

The peroneus longus muscle has been incised above, and the margins of the incision have been well separated.

Nerves of the Leg and Foot.


External popliteal or peroneal nerve
N. peronæus communis
Head of the fibula
Capitulum fibulæ
Muscular branches
Rami musculares
Aperture for the passage of the anterior tibial artery
Muscular branch
Ramus muscularis
Muscular branches
Rami musculares
Anterior tibial nerve
N. peronæus profundus
Interosseous membrane, or ligament, of the leg
Membrana interossea cruris
Extensor longus digitorum pedis muscle (drawn outwards)
M. extensor digitorum longus
Tibialis anticus muscle
M. tibialis anterior
Extensor longus vel extensor proprius hallucis muscle[2] (drawn outwards)
M. extensor hallucis longus
Muscular branches
Rami musculares
Anterior inferior tibiofibular ligament
Lig. malleoli lateralis anterius
External calcaneal branches
Rami calcanei laterales
Muscular branch[1] (to the extensor brevis digitorum pedis muscle)—Ramus muscularis
Offsets to the tarsal joints[1]
Terminal portion of the external or short saphenous nerve
N. cutaneus dorsalis lateralis
(Portio ultima nervi suralis)
Extensor brevis hallucis muscle[2]
M. extensor hallucis brevis
Internal terminal branch of the anterior tibial nerve
Extensor brevis digitorum pedis muscle (cut across, the proximal segment turned upwards, the proximal end of the distal segment turned downwards)
M. extensor digitorum brevis
Dorsal digital nerves of the outer side of the great toe and the inner side of the second toe
Nn. digitales dorsales, hallucis lateralis et digiti secundi medialis
Dorsal digital nerves of the foot
Nn. digitales dorsales pedis
2/5

[1] See Appendix, note 446. [2] See note [2] to p. 364, in Part III.

FIG. 1281.—THE ANTERIOR TIBIAL NERVE, N. PERONÆUS PROFUNDUS, AND ITS DISTRIBUTION TO THE MUSCLES OF THE FRONT OF THE LEG AND THE DORSUM OF THE FOOT. THE DISTRIBUTION ON THE FOOT OF THE TERMINAL PORTION OF THE EXTERNAL OR SHORT SAPHENOUS NERVE; IN THIS SPECIMEN THE CUTANEOUS AREA OF THIS NERVE EXTENDS TO THE FOURTH AND THIRD TOES, WHEREAS IN THE SPECIMEN DEPICTED IN FIG. 1280 THIS AREA IS LIMITED TO THE OUTER SIDE OF THE LITTLE TOE.

Nerves of the Leg and Foot.

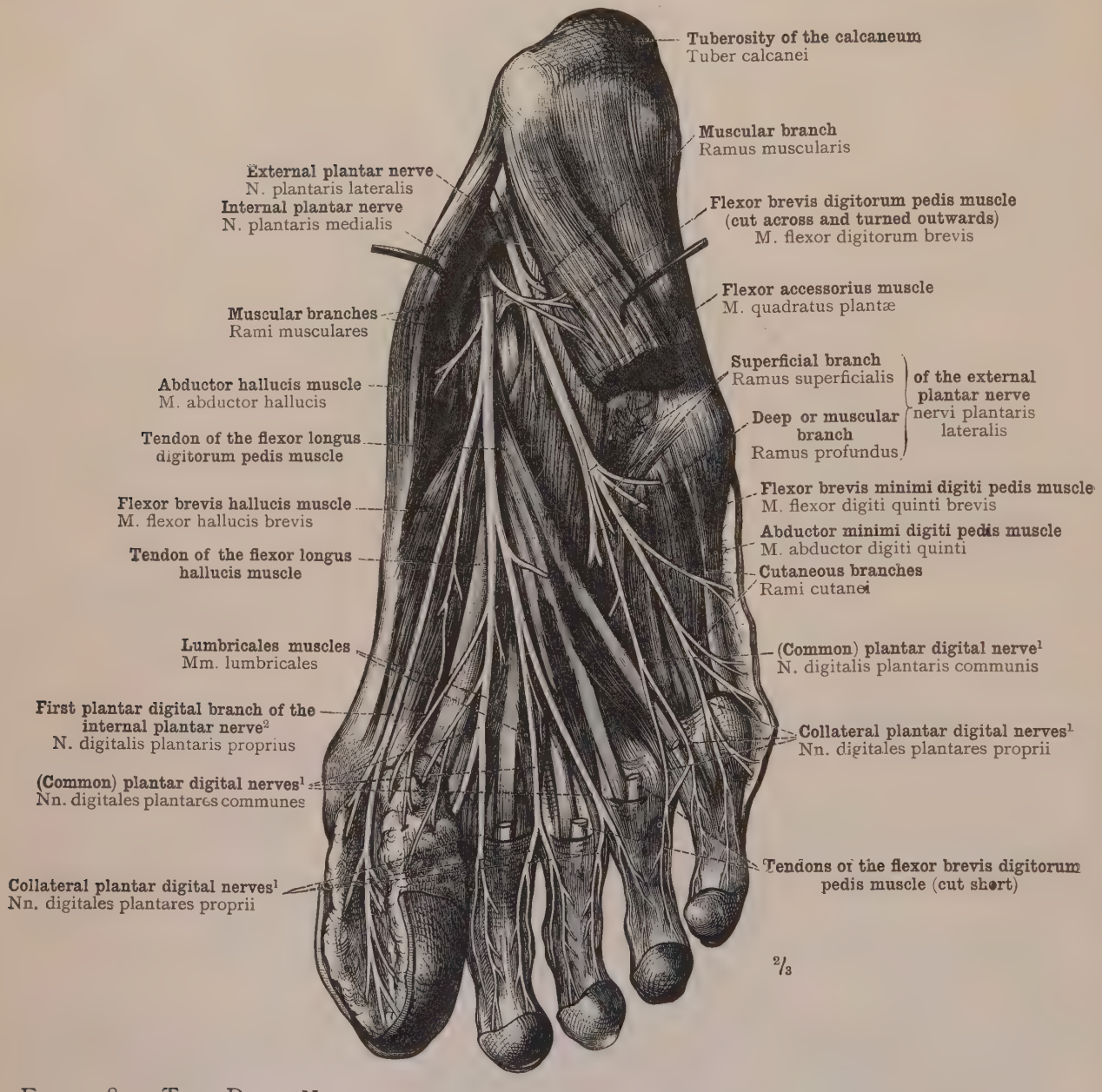
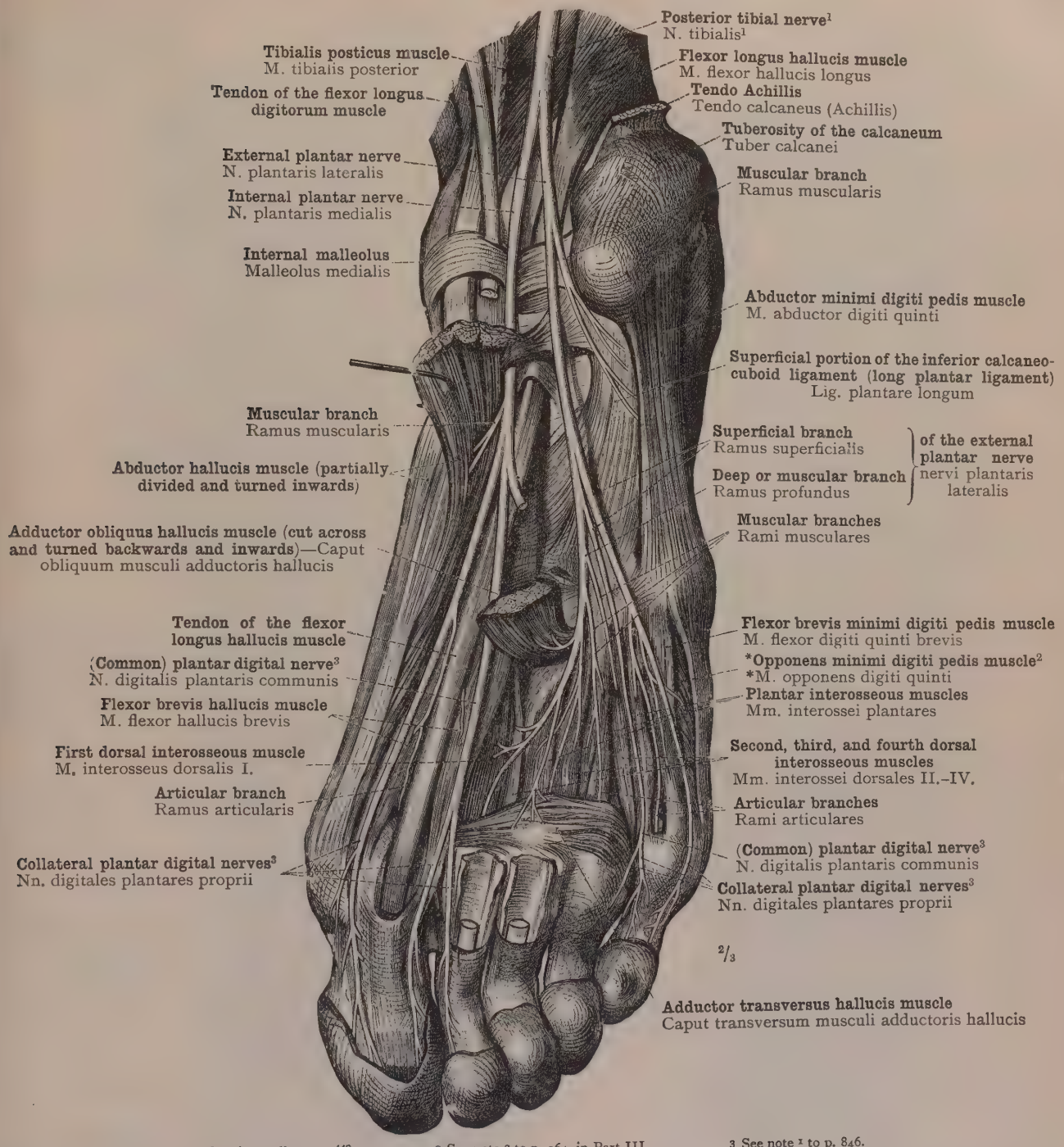


FIG. 1282.—THE DEEP NERVES OF THE SOLE OF THE FOOT, DISPLAYED BY THE PARTIAL REMOVAL OF THE PLANTAR FASCIA, APONEUROSIS PLANTARIS, AND OF THE FLEXOR BREVIS DIGITORUM PEDIS MUSCLE. THE PROXIMAL HALF OF THE ABDUCTOR HALLUCIS MUSCLE HAS BEEN DRAWN OUTWARDS, IN ORDER TO EXPOSE THE ENTRANCE OF THE EXTERNAL AND INTERNAL PLANTAR NERVES, NERVI PLANTARES, LATERALIS ET MEDIALIS, INTO THE SOLE OF THE FOOT.

[1] *Plantar Digital Nerves.*—As in the case of the *palmar* digital nerves the author distinguishes between the *nervi digitales plantares communes*, *common* plantar digital nerves (before division), and the *nervi digitales plantares propriæ*, *collateral* plantar digital nerves (after division). The distinction is often ignored in the English nomenclature.

[2] This branch (in common with which arises the *nerve to the flexor brevis hallucis muscle*) supplies the skin of the inner half of the plantar surface of the great toe. Strictly speaking it is one of the *collateral* plantar digital branches (see note [1] above)—*N. digitalis plantaris proprius* in the author's nomenclature.

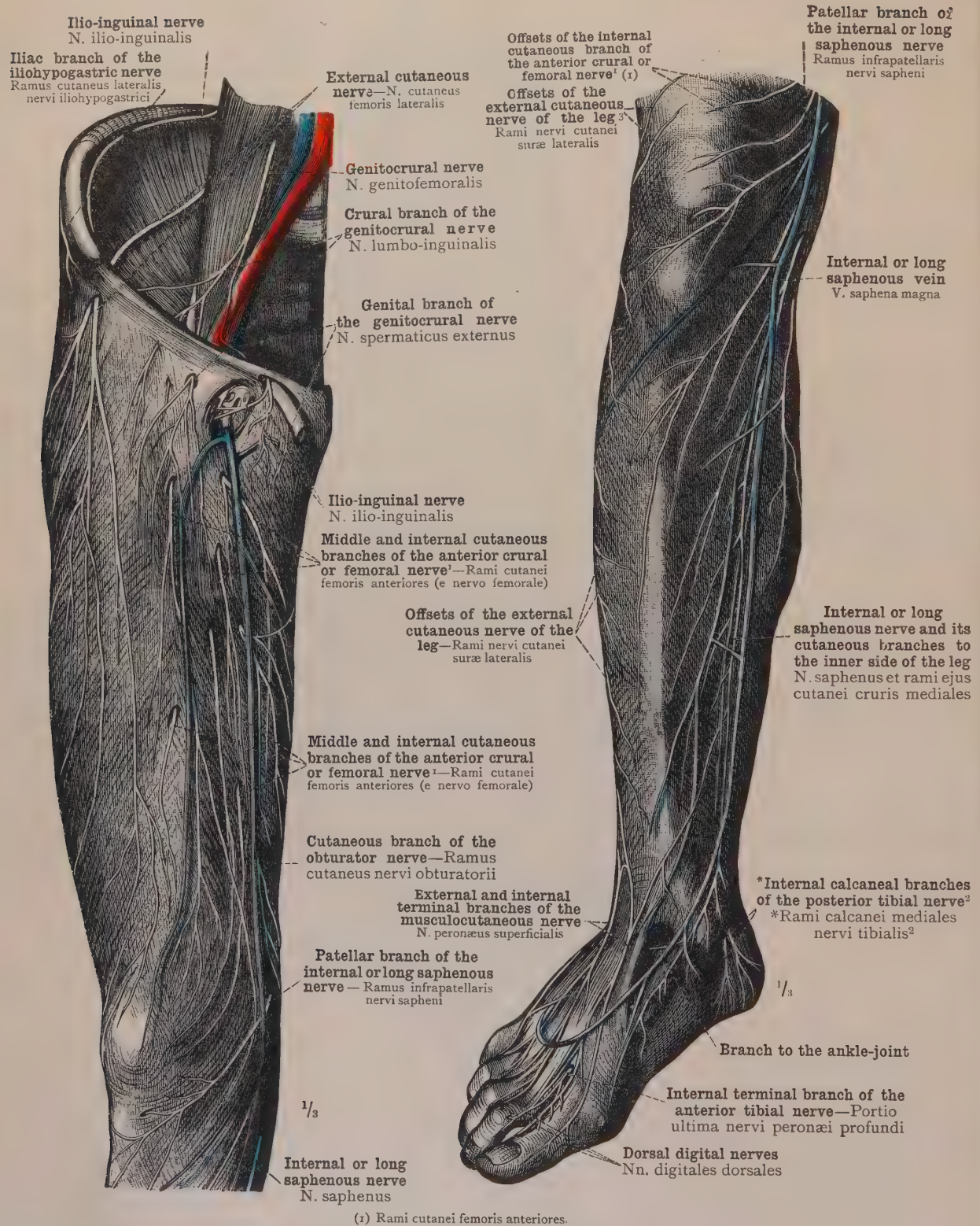
Nerves of the Sole of the Foot.



[1] See Appendix, note 442. [2] See note 3 to p. 364, in Part III. [3] See note 1 to p. 846.

FIG. 1283.—THE DEEP OR MUSCULAR BRANCH OF THE EXTERNAL PLANTAR NERVE, RAMUS PROFUNDUS NERVI PLANTARIS LATERALIS, AND ITS DISTRIBUTION TO THE DEEP MUSCLES OF THE SOLE OF THE FOOT, DISPLAYED BY THE REMOVAL OF THE LONG AND THE SHORT FLEXORS OF THE TOES, AND BY DRAWING ASIDE THE ADDUCTOR OBLIQUUS HALLUCIS MUSCLE, CAPUT OBLIQUUM MUSCULI ADDUCTORIS HALLUCIS. THE PASSAGE OF THE EXTERNAL AND INTERNAL PLANTAR NERVES, NERVI PLANTARES, MEDIALIS ET LATERALIS, INTO THE SOLE OF THE FOOT HAS BEEN EXPOSED BY CUTTING THROUGH THE SUPERFICIAL LAYERS OF THE INTERNAL ANNULAR LIGAMENT OF THE ANKLE (LIGAMENTUM LACINIATUM) AND THE ABDUCTOR HALLUCIS MUSCLE.

Nerves of the Sole of the Foot.


Ilio-inguinal nerve
N. ilio-inguinalis
Iliac branch of the iliohypogastric nerve
Ramus cutaneus lateralis nervi iliohypogastrici
External cutaneous nerve—N. cutaneus femoris lateralis
Genitocrural nerve
N. genitofemoralis
Crural branch of the genitocrural nerve
N. lumbo-inguinalis
Genital branch of the genitocrural nerve
N. spermaticus externus
Ilio-inguinal nerve
N. ilio-inguinalis
Middle and internal cutaneous branches of the anterior crural or femoral nerve[1]—Rami cutanei femoris anteriores (e nervo femorale)
Middle and internal cutaneous branches of the anterior crural or femoral nerve[1]—Rami cutanei femoris anteriores (e nervo femorale)
Cutaneous branch of the obturator nerve—Ramus cutaneus nervi obturatorii
External and internal terminal branches of the musculocutaneous nerve
N. peronæus superficialis
Patellar branch of the internal or long saphenous nerve—Ramus infrapatellaris nervi sapheni
1/3
Internal or long saphenous nerve
N. saphenus
Offsets of the internal cutaneous branch of the anterior crural or femoral nerve[1] (1)
Offsets of the external cutaneous nerve of the leg[3]
Rami nervi cutanei suræ lateralis
Offsets of the external cutaneous nerve of the leg—Rami nervi cutanei suræ lateralis
Patellar branch of the internal or long saphenous nerve
Ramus infrapatellaris nervi sapheni
Internal or long saphenous vein
V. saphena magna
Internal or long saphenous nerve and its cutaneous branches to the inner side of the leg
N. saphenus et rami ejus cutanei cruris mediales
*Internal calcaneal branches of the posterior tibial nerve[2]
*Rami calcanei mediales nervi tibialis[2]
1/3
Branch to the ankle-joint
Internal terminal branch of the anterior tibial nerve—Portio ultima nervi peronæi profundi
Dorsal digital nerves
Nn. digitales dorsales

(1) Rami cutanei femoris anteriores.

FIG. 1284.—THE CUTANEOUS NERVES OF THE FRONT AND THE INNER SIDE OF THE THIGH.

FIG. 1285.—THE CUTANEOUS NERVES OF THE INNER SIDE AND THE FRONT OF THE LEG AND OF THE INNER SIDE AND THE DORSUM OF THE FOOT.

[1] See Appendix, note 439. [2] See Appendix, note 444. [3] See note [4] to p. 840.

Cutaneous Nerves of the Lower Extremity.

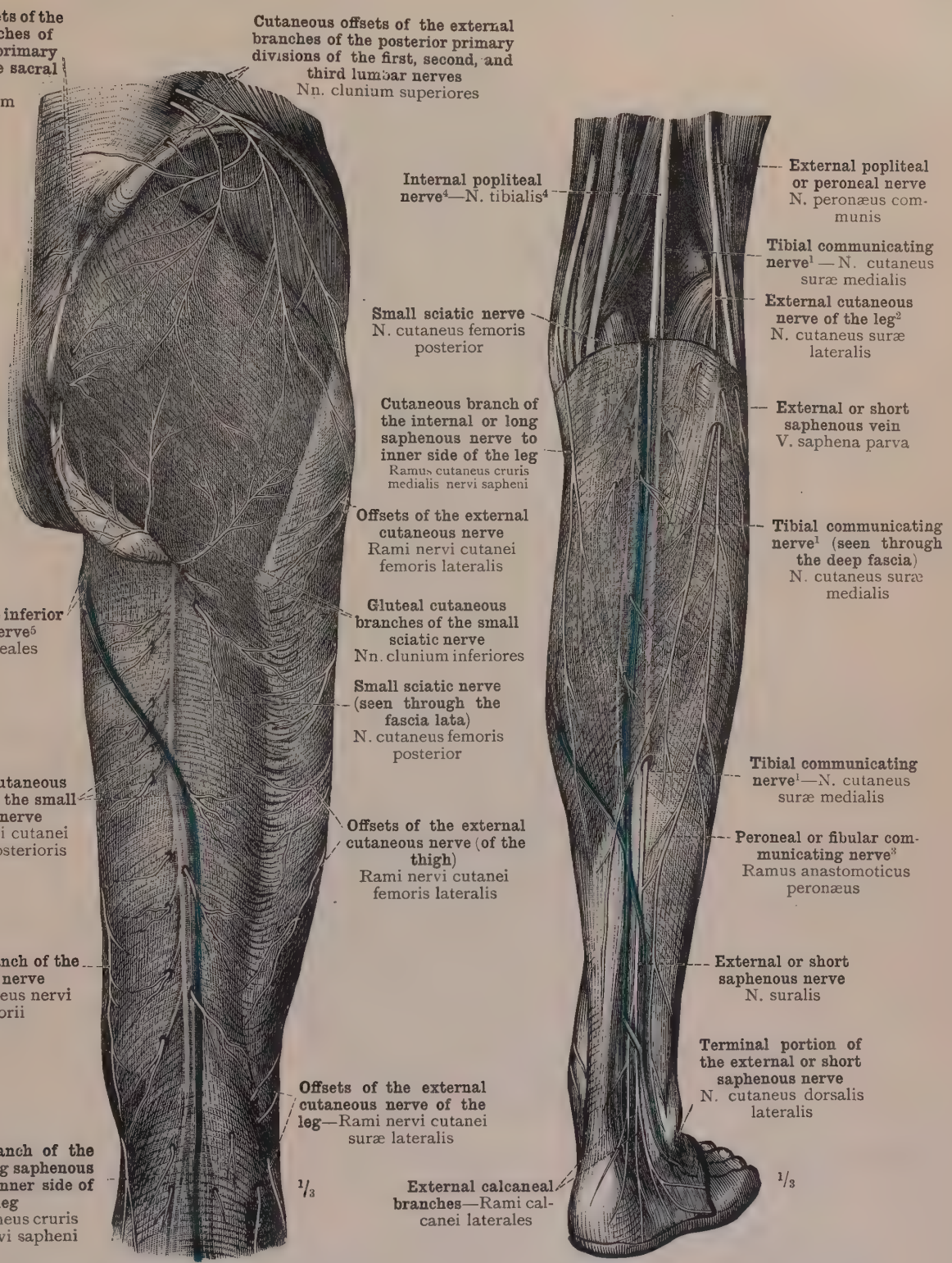

Cutaneous offsets of the external branches of the posterior primary divisions of the sacral nerves
Nn. clunium medii
Cutaneous offsets of the external branches of the posterior primary divisions of the first, second, and third lumbar nerves
Nn. clunium superiores
Internal popliteal nerve[4]—N. tibialis[4]
External popliteal or peroneal nerve
N. peronæus communis
Tibial communicating nerve[1]—N. cutaneus suræ medialis
External cutaneous nerve of the leg[2]
N. cutaneus suræ lateralis
Small sciatic nerve
N. cutaneus femoris posterior
Cutaneous branch of the internal or long saphenous nerve to inner side of the leg
Ramus cutaneus cruris medialis nervi sapheni
External or short saphenous vein
V. saphena parva
Offsets of the external cutaneous nerve
Rami nervi cutanei femoris lateralis
Tibial communicating nerve[1] (seen through the deep fascia)
N. cutaneus suræ medialis
Branches of the inferior pudendal nerve[5]
Rami perineales
Gluteal cutaneous branches of the small sciatic nerve
Nn. clunium inferiores
Small sciatic nerve (seen through the fascia lata)
N. cutaneus femoris posterior
Tibial communicating nerve[1]—N. cutaneus suræ medialis
Femoral cutaneous branches of the small sciatic nerve
Rami nervi cutanei femoris posterioris
Offsets of the external cutaneous nerve (of the thigh)
Rami nervi cutanei femoris lateralis
Peroneal or fibular communicating nerve[3]
Ramus anastomoticus peronæus
Cutaneous branch of the obturator nerve
Ramus cutaneus nervi obturatorii
External or short saphenous nerve
N. suralis
Terminal portion of the external or short saphenous nerve
N. cutaneus dorsalis lateralis
Offsets of the external cutaneous nerve of the leg—Rami nervi cutanei suræ lateralis
Cutaneous branch of the internal or long saphenous nerve to the inner side of the leg
Ramus cutaneus cruris medialis nervi sapheni
1/3
External calcaneal branches—Rami calcanei laterales
1/3

FIG. 1286.—THE CUTANEOUS NERVES OF THE GLUTEAL REGION AND THE BACK OF THE THIGH.

FIG. 1287.—THE CUTANEOUS NERVES OF THE BACK OF THE LEG.

1 Sometimes known in England by the name *communicans tibialis nerve.*
2 See note 4 to p. 840.
3 Sometimes known in England as the *communicans fibularis nerve.*
4 See Appendix, note 442.
5 See Appendix, note 443.

Communication between one of the internal calcaneal and one of the external calcaneal nerves
Communication between one of the internal calcaneal nerves and an offset of the external plantar nerve
*Internal calcaneal branches of the posterior tibial nerve[2]
*Rami calcanei mediales nervi tibialis
Panniculus adiposus of the sole of the foot
Panniculus adiposus plantæ
Cutaneous offset of the internal plantar nerve—Ramus cutaneus nervi plantaris medialis
Cutaneous offset of the external plantar nerve
Ramus cutaneus nervi plantaris lateralis
Deep fascia of the sole, or plantar fascia
Aponeurosis plantaris
Superficial branch of the external plantar nerve
Ramus superficialis nervi plantaris lateralis
Inner branch of the internal plantar nerve[3]
Ramus superficialis nervi plantaris medialis[3]
Cutaneous offsets of the plantar nerves, perforating the plantar fascia
(Common) plantar digital nerves[1]
Nn. digitales plantares communes
Collateral plantar digital nerves[1]
Nn. digitales plantares proprii
Collateral plantar digital nerves[1]
Nn. digitales plantares proprii
Collateral plantar digital nerves[1]
Nn. digitales plantares proprii
3/4

FIG. 1288.—THE CUTANEOUS NERVES OF THE SOLE OF THE FOOT, THE SKIN HAVING BEEN REMOVED, BUT THE SUPERFICIAL FASCIA (PANNICULUS ADIPOSUS) IN PART PRESERVED.

[1] See note [1] to p. 846. [2] See Appendix, note [444].

[3] *Inner Branch of the Internal Plantar Nerve.*—In the original German edition of this work the author, in the letterpress to Fig. 1288, calls this "*Oberflächlicher Ast des N. plantaris medialis,*" the *superficial branch of the internal plantar nerve.* In the German official nomenclature, however, this nerve is not, like the external plantar nerve, said to divide into a *ramus superficialis* and a *ramus profundus.* Quain calls the branch in question the *first digital branch of the internal plantar nerve,* "destined for the inner side of the great toe; it becomes subcutaneous further back than the others, and sends off a branch to the flexor brevis hallucis muscle" (Quain, *op. cit.*, vol. iii., part ii., p. 333). But in the description of Fig. 217, on the next page to that just quoted, Quain calls this nerve "the *inner branch of the internal plantar nerve,* giving branches to the flexor brevis hallucis muscle, and forming the internal collateral nerve of the great toe." The second of the two names used by Quain is that which I have adopted in the text.

Cutaneous Nerves of the Sole of the Foot.

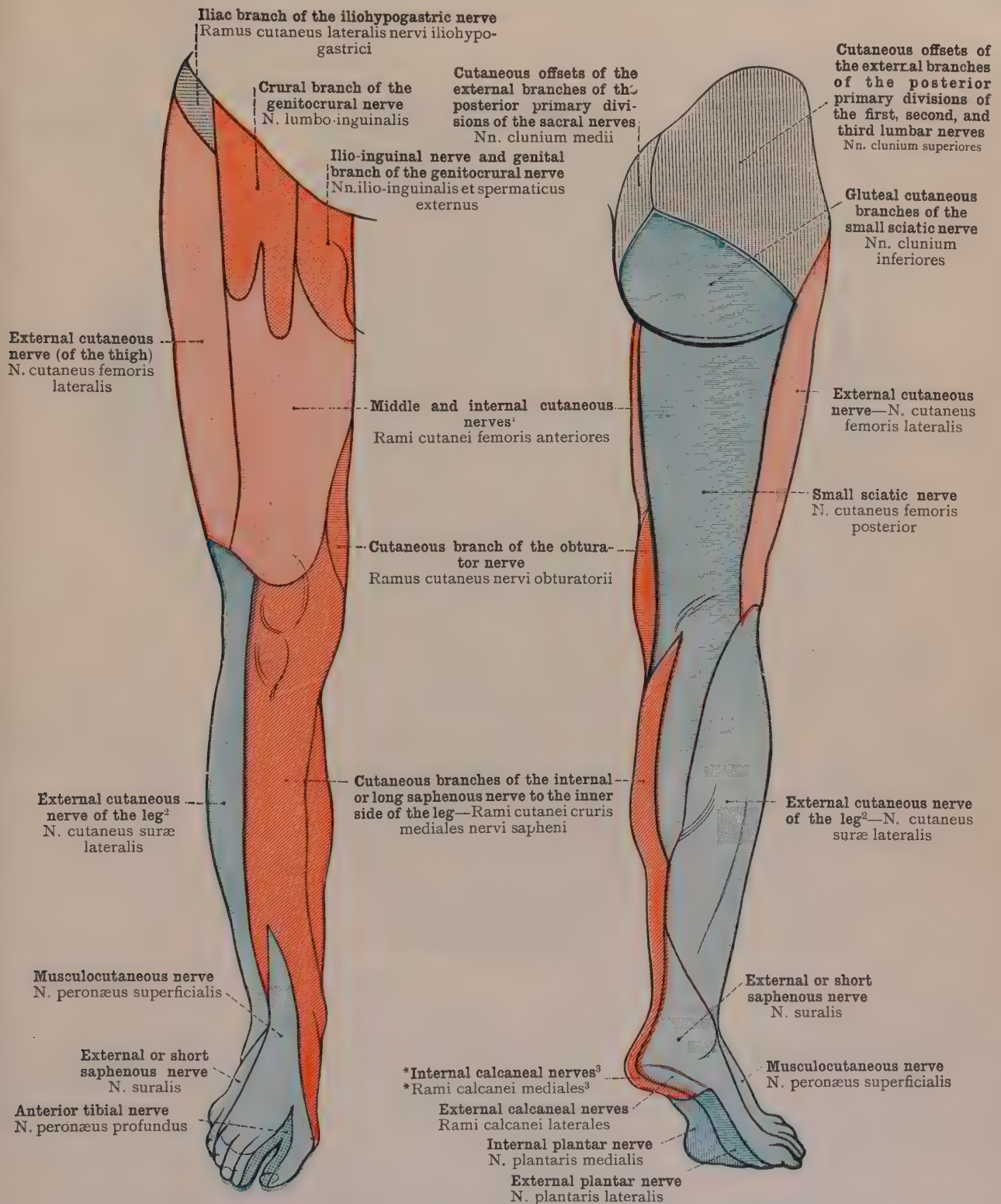
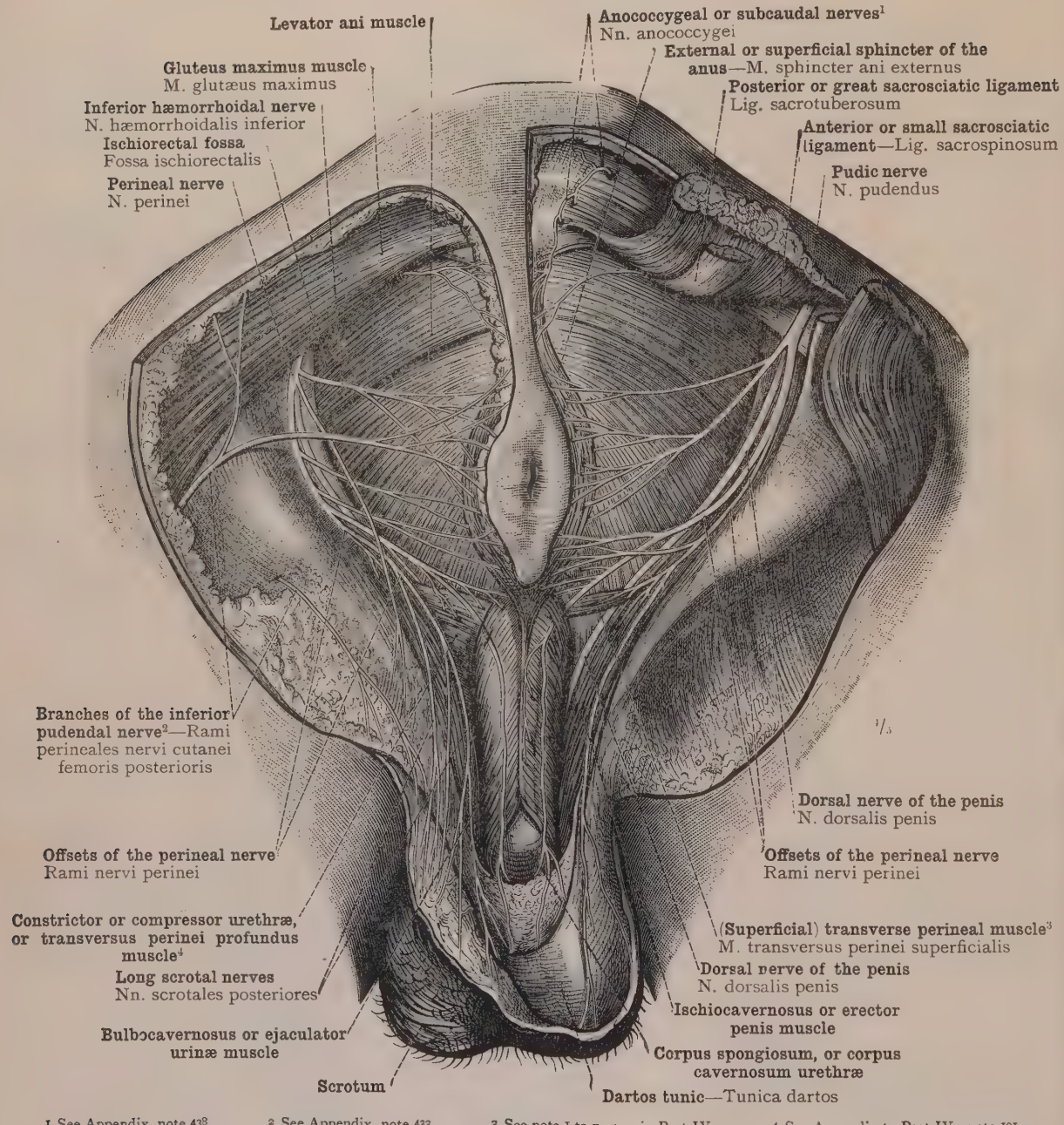

Iliac branch of the iliohypogastric nerve
Ramus cutaneus lateralis nervi iliohypogastrici
Crural branch of the genitocrural nerve
N. lumbo-inguinalis
Cutaneous offsets of the external branches of the posterior primary divisions of the sacral nerves
Nn. clunium medii
Ilio-inguinal nerve and genital branch of the genitocrural nerve
Nn. ilio-inguinalis et spermaticus externus
External cutaneous nerve (of the thigh)
N. cutaneus femoris lateralis
Middle and internal cutaneous nerves[1]
Rami cutanei femoris anteriores
Cutaneous branch of the obturator nerve
Ramus cutaneus nervi obturatorii
External cutaneous nerve of the leg[2]
N. cutaneus suræ lateralis
Cutaneous branches of the internal or long saphenous nerve to the inner side of the leg—Rami cutanei cruris mediales nervi sapheni
Musculocutaneous nerve
N. peronæus superficialis
External or short saphenous nerve
N. suralis
Anterior tibial nerve
N. peronæus profundus
Cutaneous offsets of the external branches of the posterior primary divisions of the first, second, and third lumbar nerves
Nn. clunium superiores
Gluteal cutaneous branches of the small sciatic nerve
Nn. clunium inferiores
External cutaneous nerve—N. cutaneus femoris lateralis
Small sciatic nerve
N. cutaneus femoris posterior
External cutaneous nerve of the leg[2]—N. cutaneus suræ lateralis
External or short saphenous nerve
N. suralis
*Internal calcaneal nerves[3]
*Rami calcanei mediales[3]
Musculocutaneous nerve
N. peronæus superficialis
External calcaneal nerves
Rami calcanei laterales
Internal plantar nerve
N. plantaris medialis
External plantar nerve
N. plantaris lateralis

FIG. 1289.—THE CUTANEOUS AREAS OF THE NERVES OF THE LOWER EXTREMITY. ANTERIOR SURFACE.

FIG. 1290.—THE CUTANEOUS AREAS OF THE NERVES OF THE LOWER EXTREMITY. POSTERIOR SURFACE.

[1] See Appendix, note 439. [2] See note 4 to p. 840. [3] *Calcaneoplantar nerve*, according to Quain. See Appendix, note 444.

Cutaneous Nerves of the Lower Extremity.

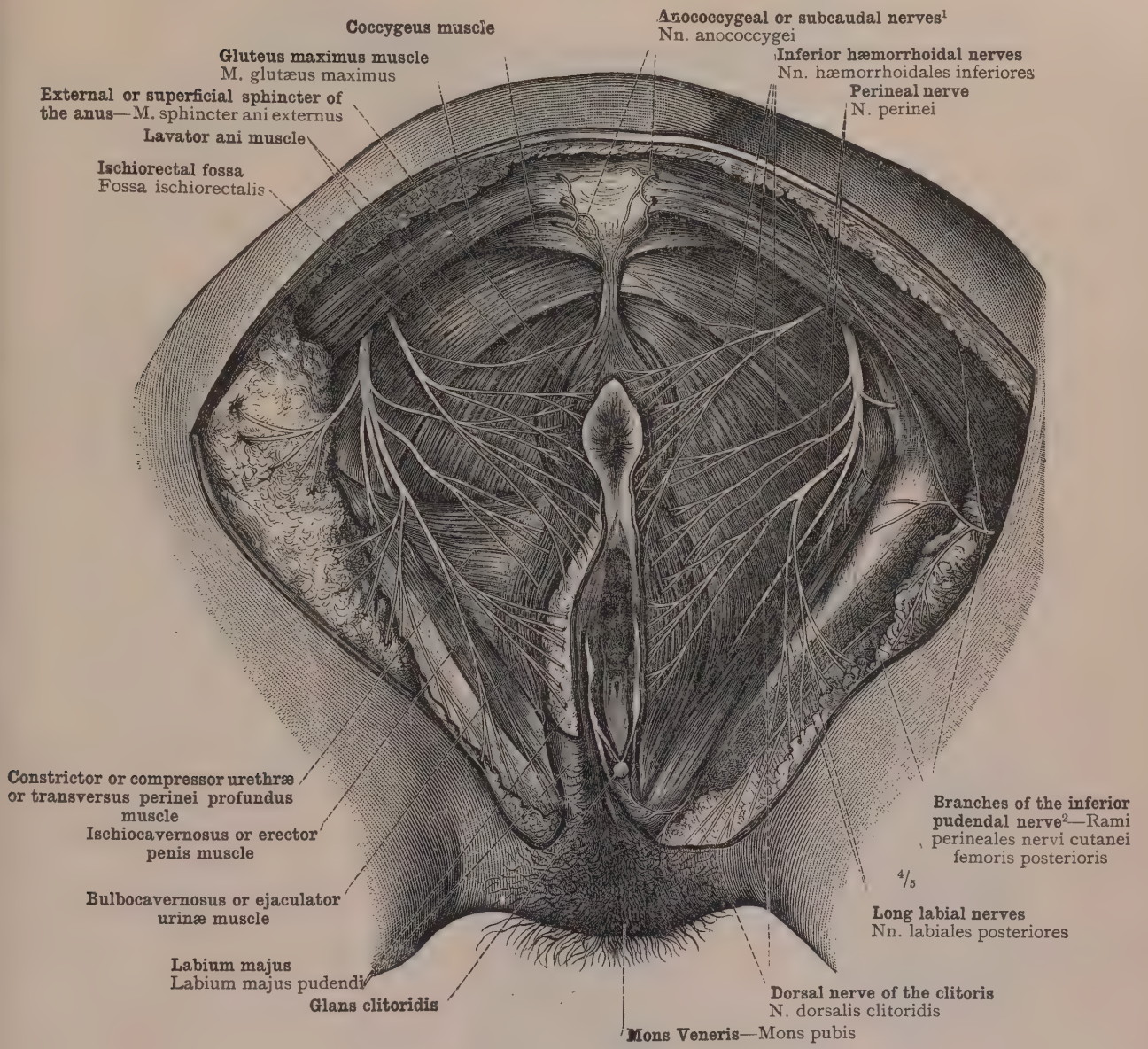


1 See Appendix, note 438. 2 See Appendix, note 433. 3 See note 1 to p. 527, in Part IV. 4 See Appendix to Part IV., note 101.

FIG. 1291.—THE DISTRIBUTION OF THE PUDIC NERVE, N. PUDENDUS, IN THE PERINEAL REGION OF THE MALE AND ON THE BACK OF THE SCROTUM. THE COURSE OF THE DORSAL NERVE OF THE PENIS, N. DORSALIS PENIS, IN THE OUTER WALL OF THE ISCHIORECTAL FOSSA, FOSSA ISCHIORECTALIS. THE ANOCOCCYGEAL OR SUBCAUDAL NERVES, NN. ANOCOCCYGEI (*see Appendix, note* 438). ON THE LEFT SIDE OF THE BODY THE BRANCHES OF THE INFERIOR PUDENDAL NERVE, RAMI PERINEALES NERVI CUTANEI FEMORIS POSTERIORIS (*see Appendix, note* 443), HAVE BEEN DISSECTED OUT. ONE OF THESE BRANCHES IS UNUSUALLY LARGE IN THIS SPECIMEN, AND SUPPLIES THE SKIN OF THE ANAL REGION (VAR.).

On the right side of the body the hinder portion of the gluteus maximus muscle and the posterior or great sacrosciatic ligament (ligamentum sacrotuberosum) have been divided, in order to display the entrance of the pudic nerve (n. pudendus) into the ischiorectal fossa. On the same side the urogenital diaphragm (*see Appendix to Part IV., note* 99) has been removed, but the (superficial) transverse perineal muscle (*see note* 1 *to p.* 527, *in Part IV.*) has been left intact. The trunk of the internal pudic nerve (n. pudendus) and the primary branches of that nerve, in so far as they run within the substance of the obturator fascia, have been dissected out of that fascia.

Nerves of the Male Perineal Region.



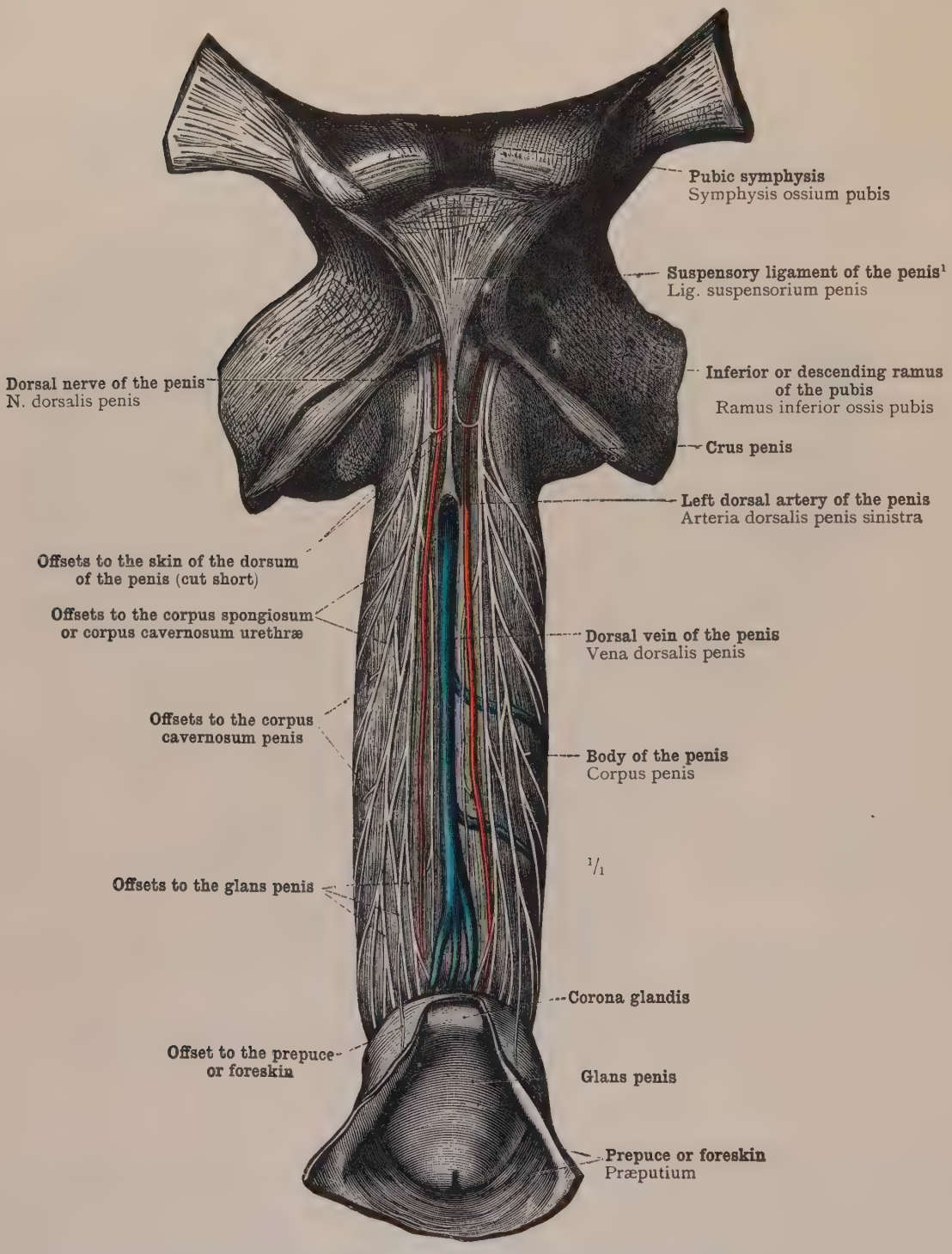
[1] See Appendix, note 438.

[2] See Appendix, note 443.

FIG. 1292.—THE DISTRIBUTION OF THE PUDIC NERVE, N. PUDENDUS, IN THE FEMALE PERINEAL AND PUBIC REGIONS. THE TRUNK OF THE PUDIC NERVE, N. PUDENDUS, IS COVERED BY THE GLUTEUS MAXIMUS MUSCLE. ON THE RIGHT SIDE OF THE BODY THE BRANCHES OF THE INFERIOR PUDENDAL NERVE, RAMI PERINEALES, NERVI CUTANEI FEMORIS POSTERIORIS (*see Appendix, note* 443), HAVE BEEN DISSECTED OUT; BUT THE BRANCHES OF THIS NERVE TO THE LABIUM MAJUS HAVE BEEN CUT SHORT. THE FORMATION OF THE ANOCOCCYGEAL OR SUBCAUDAL NERVES, NN. ANOCOCCYGEI (*see Appendix, note* 438), OUT OF THE POSTERIOR PRIMARY DIVISION OF THE COCCYGEAL NERVE AND OUT OF PERFORATING BRANCHES WHICH ARISE FROM THE ANTERIOR PRIMARY DIVISIONS OF THE FOURTH AND FIFTH SACRAL NERVES AND THE COCCYGEAL NERVE. IN THIS CONNEXION SEE ALSO FIG. 1295.

On the right side of the body the urogenital diaphragm (*see Appendix to Part IV., note* 99) and the labium majus have been entirely removed, whereas on the left side the skin has only been in part dissected off the labium majus, and the constrictor or compressor urethræ or transversus perinei profundus (*see Appendix to Part IV., note* 101) muscle has been left intact.

Nerves of the Female Perineal Region.


Pubic symphysis
Symphysis ossium pubis
Suspensory ligament of the penis[1]
Lig. suspensorium penis
Dorsal nerve of the penis
N. dorsalis penis
Inferior or descending ramus of the pubis
Ramus inferior ossis pubis
Crus penis
Left dorsal artery of the penis
Arteria dorsalis penis sinistra
Offsets to the skin of the dorsum of the penis (cut short)
Offsets to the corpus spongiosum or corpus cavernosum urethræ
Dorsal vein of the penis
Vena dorsalis penis
Offsets to the corpus cavernosum penis
Body of the penis
Corpus penis
1/1
Offsets to the glans penis
Corona glandis
Offset to the prepuce or foreskin
Glans penis
Prepuce or foreskin
Præputium

[1] This ligament is in England commonly distinguished as the *true suspensory ligament of the penis.* See note [2] to p. 382, in Part III.—Tr.

FIG. 1293.—THE DISTRIBUTION OF THE DORSAL NERVE OF THE PENIS, N. DORSALIS PENIS, ON THE DORSUM OF THE PENIS, AND THE RELATION OF THE DORSAL ARTERY AND VEIN OF THE PENIS TO THE OFFSETS OF THE DORSAL NERVE OF THE PENIS.

The skin of the penis has been removed, with the exception of the prepuce or foreskin (præputium); an incision has been made through the dorsal portion of the latter, in the median line.

Nerves of the Penis.

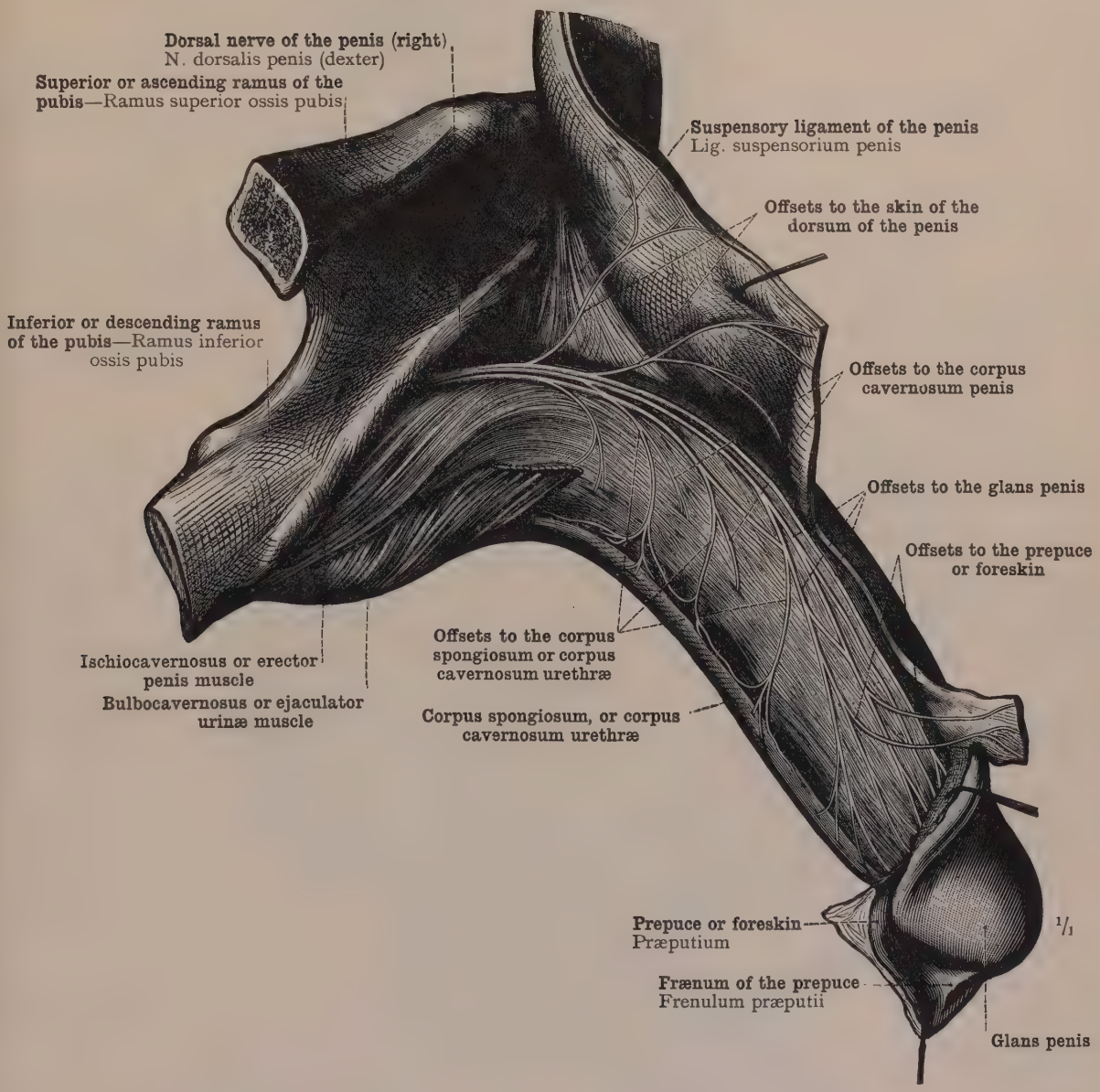
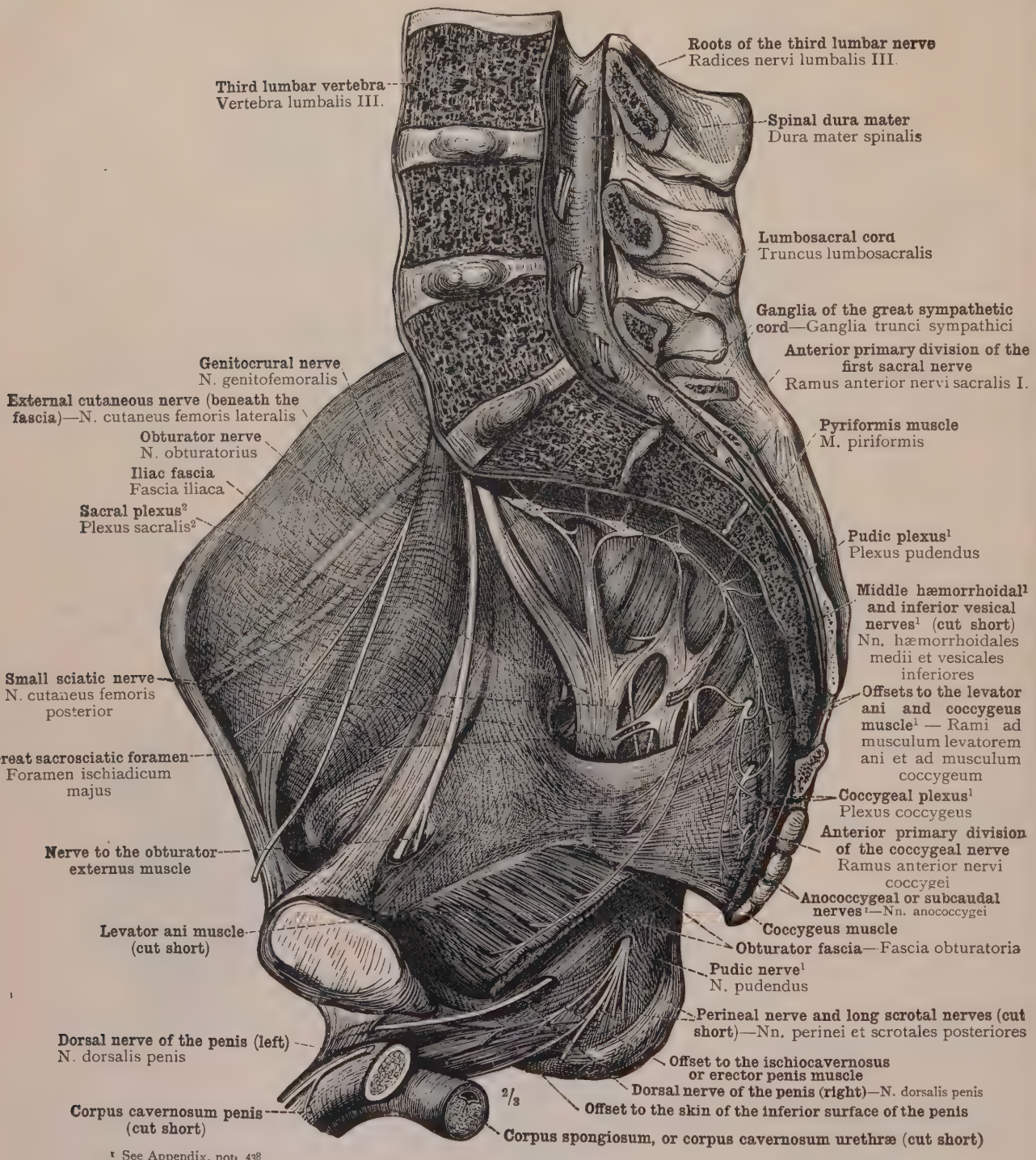

Dorsal nerve of the penis (right)
N. dorsalis penis (dexter)
Superior or ascending ramus of the pubis—Ramus superior ossis pubis
Suspensory ligament of the penis
Lig. suspensorium penis
Offsets to the skin of the dorsum of the penis
Inferior or descending ramus of the pubis—Ramus inferior ossis pubis
Offsets to the corpus cavernosum penis
Offsets to the glans penis
Offsets to the prepuce or foreskin
Offsets to the corpus spongiosum or corpus cavernosum urethræ
Ischiocavernosus or erector penis muscle
Bulbocavernosus or ejaculator urinæ muscle
Corpus spongiosum, or corpus cavernosum urethræ
Prepuce or foreskin
Præputium
1/1
Frænum of the prepuce
Frenulum præputii
Glans penis

FIG. 1294.—THE DISTRIBUTION OF THE DORSAL NERVE OF THE PENIS IN THE SUBSTANCE OF THE PENIS AND THE SKIN OF THAT ORGAN. SEEN FROM THE RIGHT SIDE.

The preserved portion of the skin of the right side of the penis and the mons pubis has been drawn forwards. The anterior portion of the bulbocavernosus or erector penis muscle has been cut away, in order to expose to view the branch of the dorsal nerve of the penis that enters that muscle.

Nerves of the Penis.


Roots of the third lumbar nerve
Radices nervi lumbalis III.
Third lumbar vertebra
Vertebra lumbalis III.
Spinal dura mater
Dura mater spinalis
Lumbosacral cord
Truncus lumbosacralis
Ganglia of the great sympathetic cord—Ganglia trunci sympathici
Anterior primary division of the first sacral nerve
Ramus anterior nervi sacralis I.
Genitocrural nerve
N. genitofemoralis
External cutaneous nerve (beneath the fascia)—N. cutaneus femoris lateralis
Obturator nerve
N. obturatorius
Iliac fascia
Fascia iliaca
Sacral plexus[2]
Plexus sacralis[2]
Pyriformis muscle
M. piriformis
Pudic plexus[1]
Plexus pudendus
Middle hæmorrhoidal[1] and inferior vesical nerves[1] (cut short)
Nn. hæmorrhoidales medii et vesicales inferiores
Small sciatic nerve
N. cutaneus femoris posterior
Offsets to the levator ani and coccygeus muscle[1] — Rami ad musculum levatorem ani et ad musculum coccygeum
Great sacrosciatic foramen
Foramen ischiadicum majus
Coccygeal plexus[1]
Plexus coccygeus
Anterior primary division of the coccygeal nerve
Ramus anterior nervi coccygei
Nerve to the obturator externus muscle
Anococcygeal or subcaudal nerves[1]—Nn. anococcygei
Levator ani muscle (cut short)
Coccygeus muscle
Obturator fascia—Fascia obturatoria
Pudic nerve[1]
N. pudendus
Perineal nerve and long scrotal nerves (cut short)—Nn. perinei et scrotales posteriores
Dorsal nerve of the penis (left)
N. dorsalis penis
Offset to the ischiocavernosus or erector penis muscle
Dorsal nerve of the penis (right)—N. dorsalis penis
2/3
Corpus cavernosum penis (cut short)
Offset to the skin of the inferior surface of the penis
Corpus spongiosum, or corpus cavernosum urethræ (cut short)

[1] See Appendix, note 438.

[2] The nervous plexus denoted here by the term *plexus sacralis* is by some English authors called the *sciatic plexus*, the *sacral plexus* of these authors comprising both the *plexus sacralis* and the *plexus pudendus* of Toldt. See Appendix, note 438.

FIG. 1295.—THE SACRAL PLEXUS, PLEXUS SACRALIS (*see note* [2] *above*), THE PUDIC PLEXUS, PLEXUS PUDENDUS (*see Appendix, note* 438), AND THE COCCYGEAL PLEXUS, PLEXUS COCCYGEUS (*see Appendix, note* 438), AS SEEN IN THE RIGHT HALF OF A MALE PELVIS DIVIDED BY A MEDIAN SAGITTAL SECTION. THE NERVES TO THE LEVATOR ANI AND COCCYGEUS MUSCLES, DERIVED FROM THE THIRD AND FOURTH SACRAL NERVES (*see Appendix, note* 438). THE OFFSETS FROM THE ANTERIOR PRIMARY DIVISIONS OF THE COCCYGEAL NERVE AND THE FOURTH AND FIFTH SACRAL NERVES WHICH, AFTER RECEIVING A COMMUNICATING BRANCH FROM THE SYMPATHETIC NERVOUS SYSTEM, PERFORATE THE COCCYGEUS MUSCLE AND ASSIST IN FORMING THE ANOCOCCYGEAL OR SUBCAUDAL NERVES, NN. ANOCOCCYGEI. (IN THIS CONNEXION SEE ALSO FIG. 1292.) THE PASSAGE OF BRANCHES OF THE PUDIC NERVE, N. PUDENDUS, THROUGH THE OBTURATOR FASCIA INTO THE ISCHIORECTAL FOSSA.

The Sacral Plexus, Plexus Sacralis; the Pudic Plexus, Plexus Pudendus; and the Coccygeal Plexus, Plexus Coccygeus (*see Appendix, note* 438, *and note* [2] *above*).

SYSTEMA NERVORUM PERIPHERICUM

THE PERIPHERAL NERVOUS SYSTEM

NERVI CEREBRALES

CRANIAL NERVES

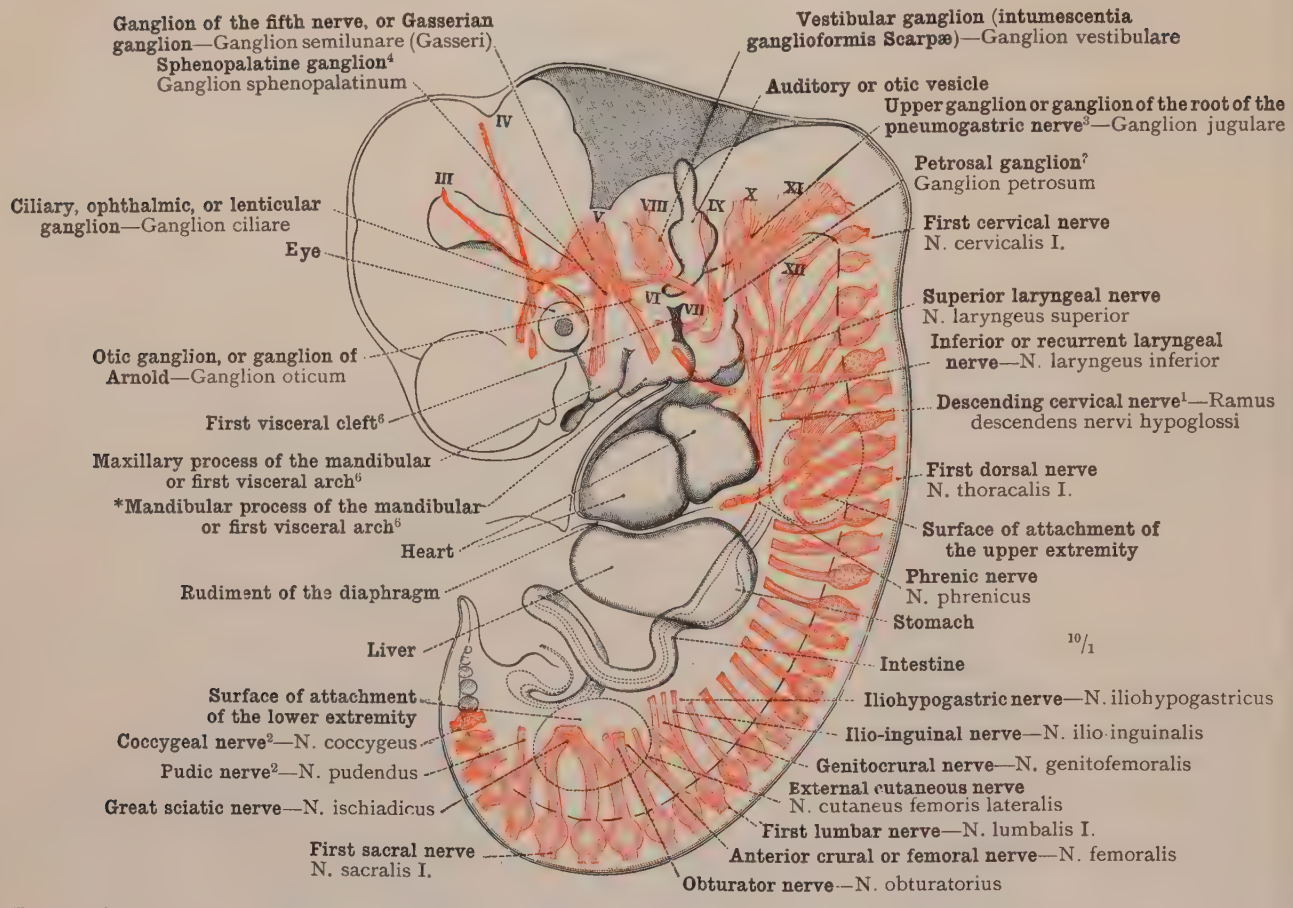


FIG. 1296.—RUDIMENT OF THE CEREBROSPINAL NERVOUS SYSTEM IN A HUMAN EMBRYO HAVING A BODY-LENGTH OF $\frac{2}{5}$ INCH (10·2 MILLIMETRES). ABOUT THE THIRTY-SECOND DAY OF INTRA-UTERINE LIFE. AFTER W. HIS.

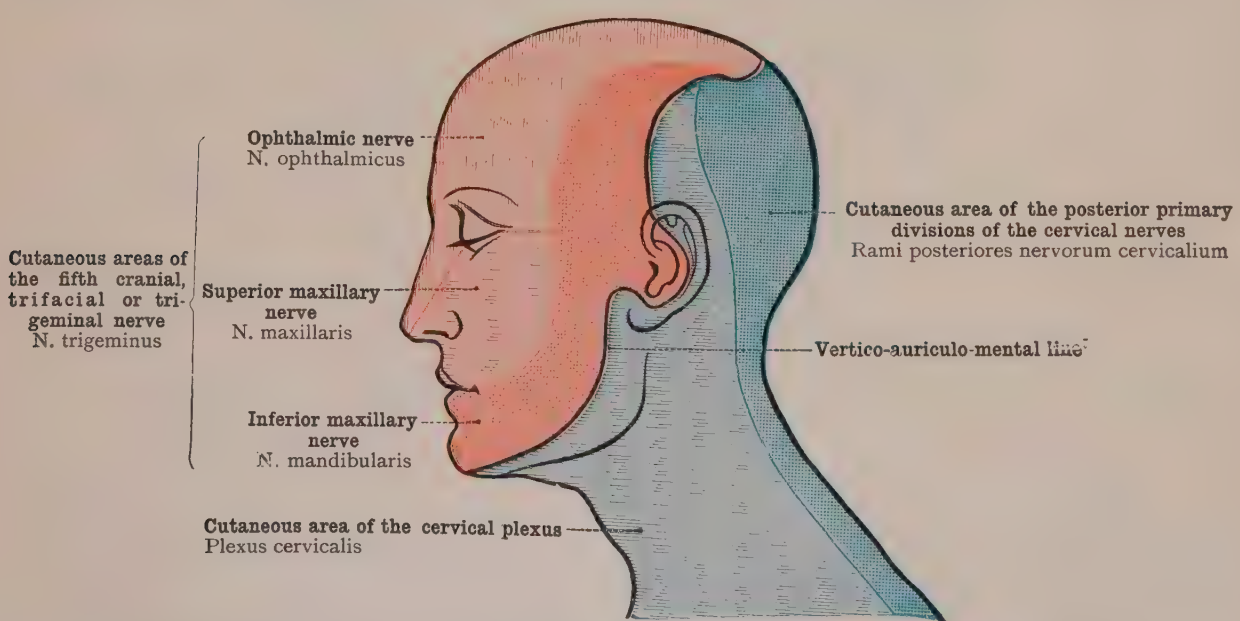


FIG. 1297.—THE CUTANEOUS AREAS OF THE FIFTH CRANIAL, TRIFACIAL, OR TRIGEMINAL NERVE, N TRIGEMINUS, AND ITS THREE DIVISIONS.

1 Often called the *descendens noni nerve.* See Appendix, note 420.
2 See Appendix, note 438.
3 See Appendix, note 447.
4 Known also as *Meckel's ganglion* and as the *nasal ganglion.*
5 See note 1 to p. 811.
6 See Appendix, note 448.
7 Also known as *Andersch's ganglion.*

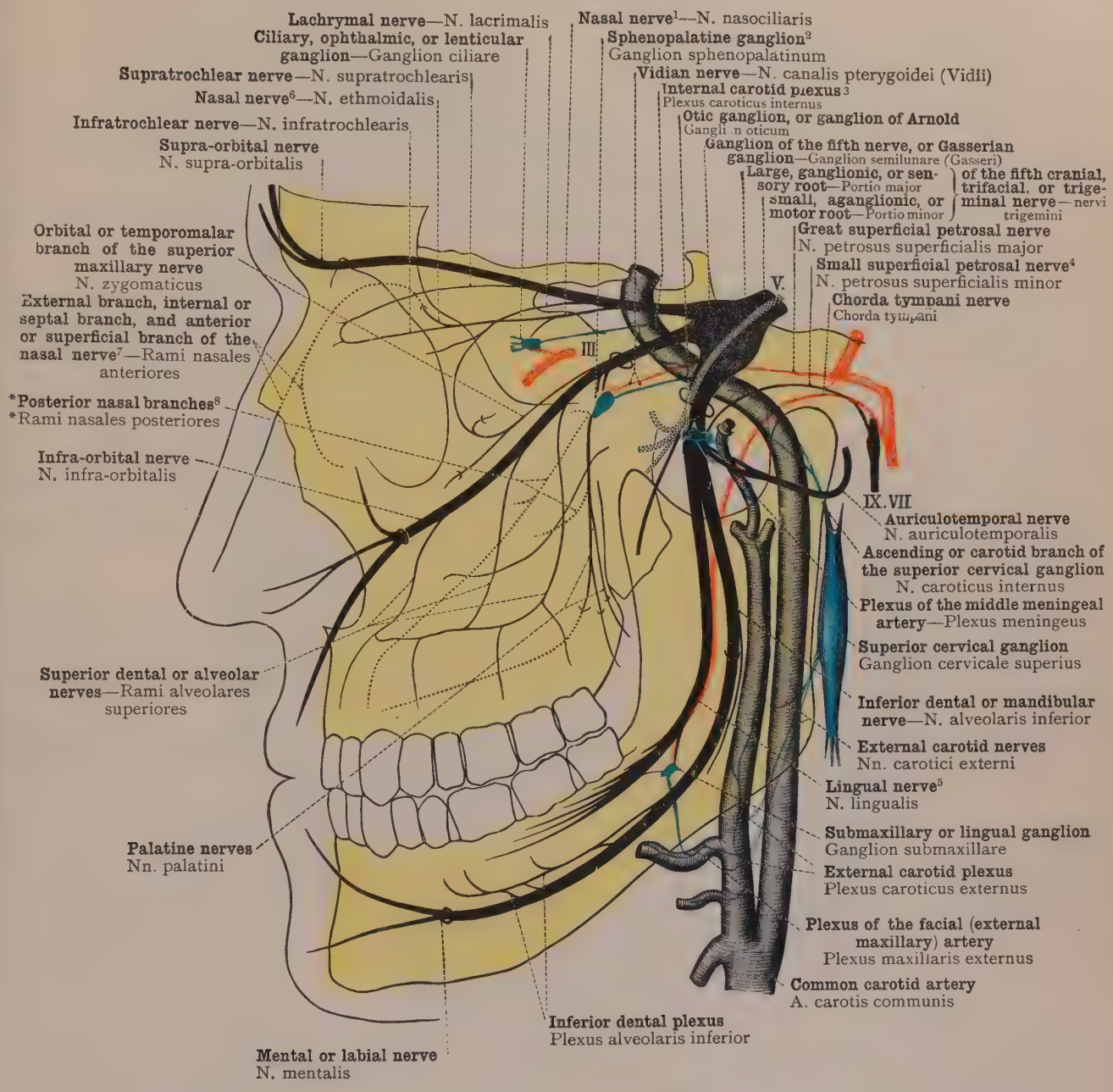
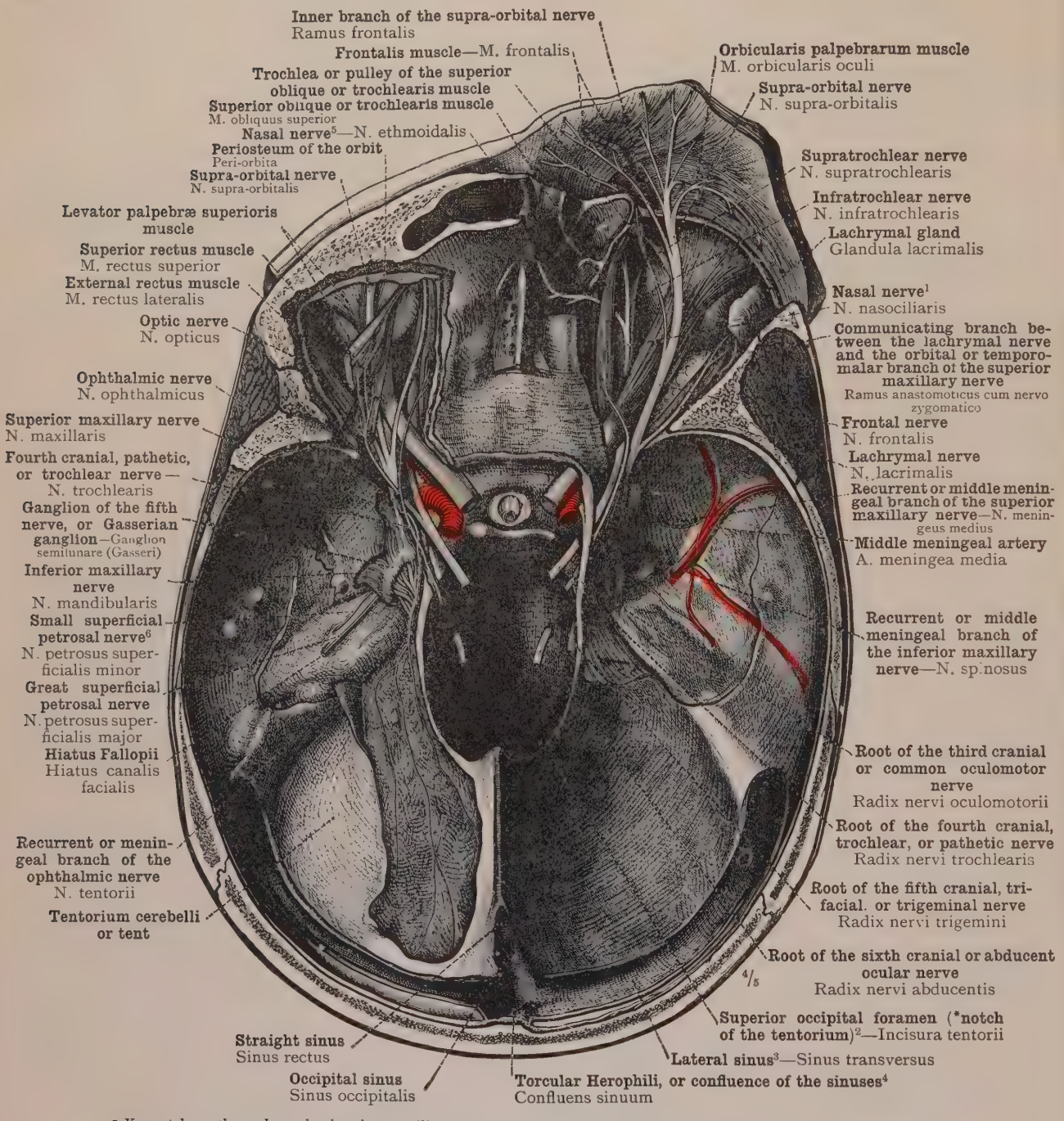


FIG. 1298.—THE FIFTH CRANIAL, TRIGEMINAL, OR TRIFACIAL NERVE, N. TRIGEMINUS; DIAGRAMMATIC REPRESENTATION OF ITS DISTRIBUTION AND OF ITS PRINCIPAL COMMUNICATIONS.

The nerves tinted red are the third cranial or common oculomotor nerve, nervus oculomotorius (III.), and the seventh cranial or facial nerve, nervus facialis (VII.); the Roman numeral V. indicates the roots of the trigeminal nerve, the numeral IX. indicates the glossopharyngeal nerve. The ganglia connected with the trigeminal nerve are tinted blue; blue also are those parts of the sympathetic nervous system that appear in the figure.

[1] Known also as the *oculonasal* and as the *nasociliary nerve*.
[2] Known also as *Meckel's ganglion* and as the *nasal ganglion*.
[3] *Carotid Plexus.*—In England the plexus of nerves surrounding the internal carotid artery is often spoken of as the *carotid plexus* without qualification.
[4] By Arnold called the *long root of the otic ganglion*.
[5] Formerly known also as the *gustatory nerve*.
[6] See Appendix, note 449.
[7] The terminal branches of the *nervus ethmoidalis anterius* of the German nomenclature. See Appendix, note 449.
[8] See Appendix, note 450.

Trigeminus Group.

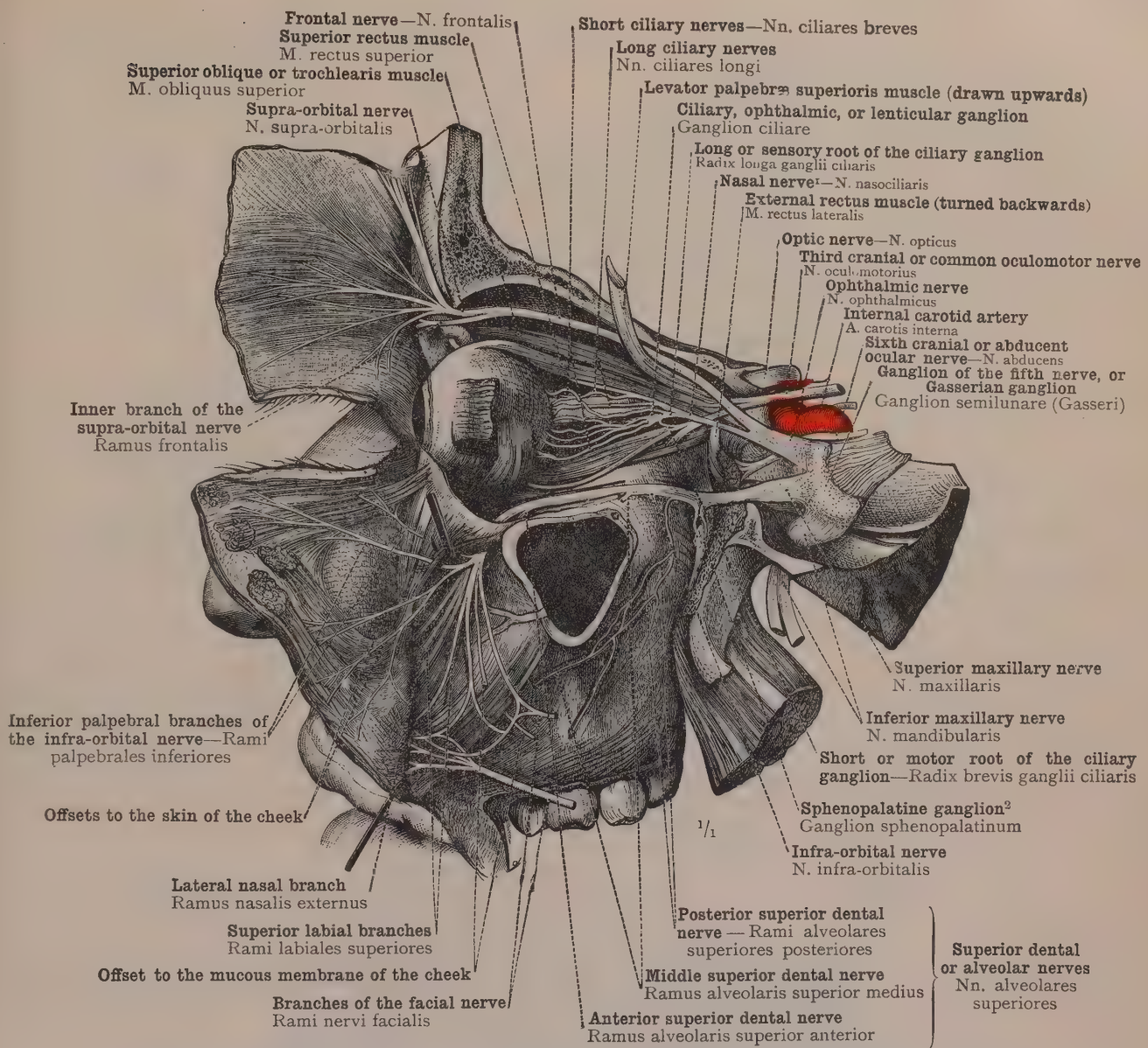


1 Known also as the *oculonasal* and as the *nasociliary nerve.* 2 See Appendix, note 412. 3 See Appendix, note 410.
4 In this specimen the somewhat exceptional condition of a true *confluence* is exhibited. See Appendix to Part V., note 266.
5 See Appendix, note 449. 6 By Arnold called the *long root of the otic ganglion.*

FIG. 1299.—THE OPHTHALMIC NERVE, N. OPHTHALMICUS, OR FIRST DIVISION OF THE FIFTH CRANIAL, TRIFACIAL, OR TRIGEMINAL NERVE, N. TRIGEMINUS, AND ALSO THE UPPER BRANCH OF THE THIRD CRANIAL OR COMMON OCULOMOTOR NERVE, RAMUS SUPERIOR NERVI OCULOMOTORII, AND THE FOURTH CRANIAL, PATHETIC, OR TROCHLEAR NERVE, N. TROCHLEARIS, DISPLAYED BY THE REMOVAL OF THE UPPER WALL OF THE ORBIT. THE NERVES OF THE DURA MATER: THE RECURRENT OR MENINGEAL BRANCH OF THE OPHTHALMIC NERVE, N. TENTORII (WITH REGARD TO THE ORIGIN OF THIS NERVE, FIG. 1304 SHOULD BE EXAMINED); THE RECURRENT OR MIDDLE MENINGEAL BRANCH OF THE SUPERIOR MAXILLARY NERVE, N. MENINGEUS MEDIUS; AND THE RECURRENT OR MIDDLE MENINGEAL BRANCH OF THE INFERIOR MAXILLARY NERVE, N. SPINOSUS.

On the left side of the body the upper margin of the orbit has been left intact, but the levator palpebræ superioris and superior rectus muscles have on this side been detached from their origins and turned outwards, in order to show the branches of the third cranial or common oculomotor nerve that enter these muscles.

Trigeminus Group.


Frontal nerve—N. frontalis
Superior rectus muscle
M. rectus superior
Superior oblique or trochlearis muscle
M. obliquus superior
Supra-orbital nerve
N. supra-orbitalis
Short ciliary nerves—Nn. ciliares breves
Long ciliary nerves
Nn. ciliares longi
Levator palpebræ superioris muscle (drawn upwards)
Ciliary, ophthalmic, or lenticular ganglion
Ganglion ciliare
Long or sensory root of the ciliary ganglion
Radix longa ganglii ciliaris
Nasal nerve[1]—N. nasociliaris
External rectus muscle (turned backwards)
M. rectus lateralis
Optic nerve—N. opticus
Third cranial or common oculomotor nerve
N. oculomotorius
Ophthalmic nerve
N. ophthalmicus
Internal carotid artery
A. carotis interna
Sixth cranial or abducent ocular nerve—N. abducens
Ganglion of the fifth nerve, or Gasserian ganglion
Ganglion semilunare (Gasseri)
Inner branch of the supra-orbital nerve
Ramus frontalis
Superior maxillary nerve
N. maxillaris
Inferior maxillary nerve
N. mandibularis
Inferior palpebral branches of the infra-orbital nerve—Rami palpebrales inferiores
Short or motor root of the ciliary ganglion—Radix brevis ganglii ciliaris
Offsets to the skin of the cheek
Sphenopalatine ganglion[2]
Ganglion sphenopalatinum
1/1
Infra-orbital nerve
N. infra-orbitalis
Lateral nasal branch
Ramus nasalis externus
Superior labial branches
Rami labiales superiores
Offset to the mucous membrane of the cheek
Branches of the facial nerve
Rami nervi facialis
Posterior superior dental nerve — Rami alveolares superiores posteriores
Middle superior dental nerve
Ramus alveolaris superior medius
Anterior superior dental nerve
Ramus alveolaris superior anterior
Superior dental or alveolar nerves
Nn. alveolares superiores

[1] Known also as the *nasociliary* and as the *oculonasal nerves.* [2] Known also as *Meckel's ganglion* and as the *nasal ganglion.*

[3] The *quadratus labii superioris muscle* of Continental anatomists comprises three muscles in the English nomenclature, viz., the levator labii superioris alæque nasi, levator labii superioris proprius, and zygomaticus minor. See Fig. 545, p. 300, in Part III.

FIG. 1300.—THE SUPERIOR MAXILLARY NERVE, N. MAXILLARIS, OR SECOND DIVISION OF THE FIFTH CRANIAL, TRIFACIAL, OR TRIGEMINAL NERVE, N. TRIGEMINUS, AND ITS CONNEXION WITH THE SPHENOPALATINE GANGLION (MECKEL'S GANGLION, OR THE NASAL GANGLION), GANGLION SPHENOPALATINUM, BY MEANS OF THE TWO SPHENOPALATINE NERVES, NN. SPHENOPALATINI. THE SUPERIOR DENTAL OR ALVEOLAR NERVES, NN. ALVEOLARES SUPERIORES. THE FACIAL RADIATION OF THE TERMINAL BRANCHES OF THE INFRA-ORBITAL NERVE, WHICH, BY THEIR UNION WITH THE INFRA-ORBITAL BRANCHES OF THE FACIAL NERVE, FORM THE INFRA-ORBITAL PLEXUS. IN CONNEXION WITH THE OPHTHALMIC NERVE, OR FIRST DIVISION OF THE FIFTH CRANIAL NERVE, THE FRONTAL NERVE, N. FRONTALIS, AND THE CILIARY, OPHTHALMIC, OR LENTICULAR GANGLION, GANGLION CILIARE, WITH THE CILIARY NERVES, NN. CILIARES, THAT ENTER THE EYEBALL, ARE DISPLAYED. LEFT SIDE OF FACE, SEEN FROM THE LEFT SIDE.

The skin of the forehead and the cheek and the superficial facial muscles have been dissected up and turned forwards. This having been done, the lower jaw was removed, and the outer wall of the orbit and the outer wall of the skull were cut away until the sphenomaxillary fossa, fossa pterygopalatina, was reached. The levator palpebræ superioris and external rectus muscles have been cut across and their proximal segments turned backwards. The quadratus labii superioris muscle (*see note* [3] *above*), which covers the infra-orbital plexus, has been drawn forwards with a hook.

Trigeminus Group.

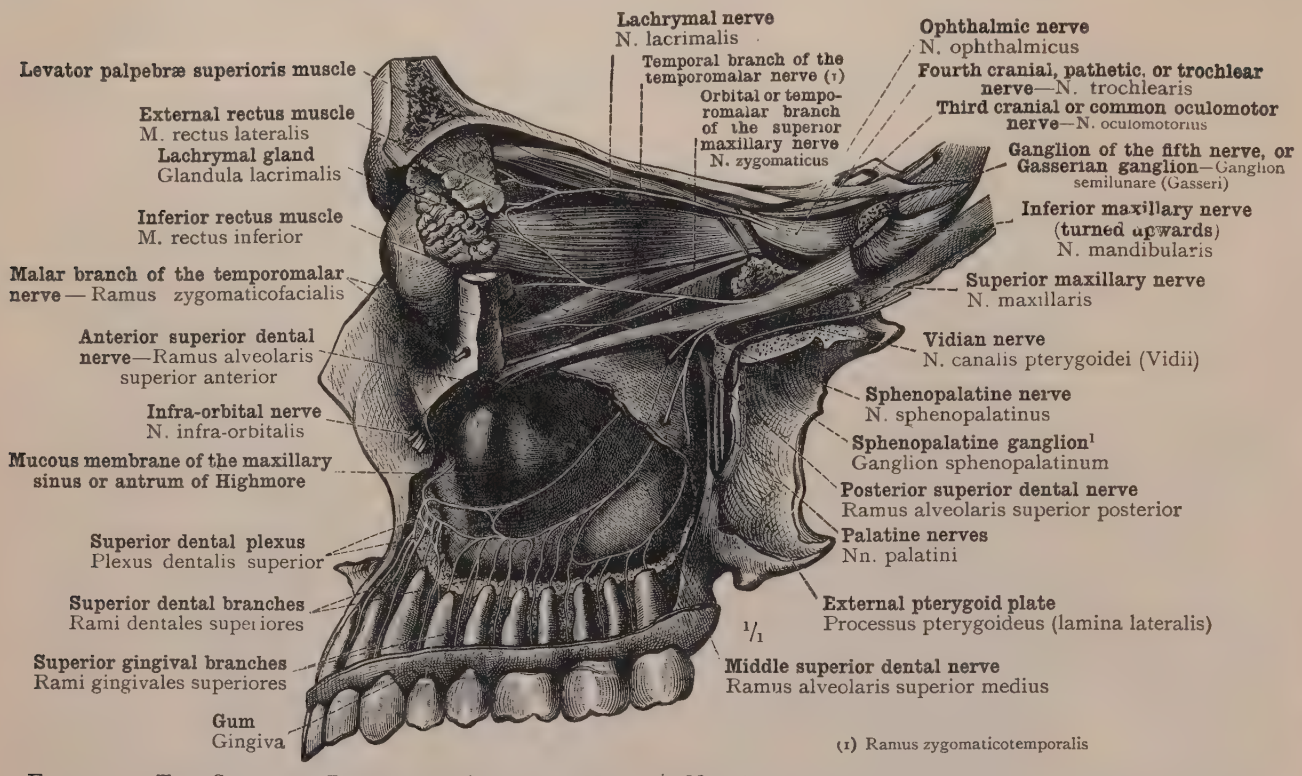


FIG. 1301.—THE SUPERIOR DENTAL OR ALVEOLAR NERVES, NN. ALVEOLARES SUPERIORES, WITH THE SUPERIOR DENTAL PLEXUS, PLEXUS DENTALIS SUPERIOR, AND THE SUPERIOR DENTAL AND SUPERIOR GINGIVAL BRANCHES, RAMI DENTALES SUPERIORES ET RAMI GINGIVALES SUPERIORES, DISPLAYED BY THE REMOVAL OF THE OUTER LAMELLA OF THE SUPERIOR MAXILLARY BONE. THE ORBITAL OR TEMPOROMALAR BRANCH OF THE SUPERIOR MAXILLARY NERVE, N. ZYGOMATICUS, AND ITS COMMUNICATION WITH THE LACHRYMAL NERVE, N. LACHRYMALIS. LEFT SIDE OF THE FACE, SEEN FROM THE LEFT SIDE.

In the maxillary sinus or antrum of Highmore the outer surface of the mucous membrane is exposed.

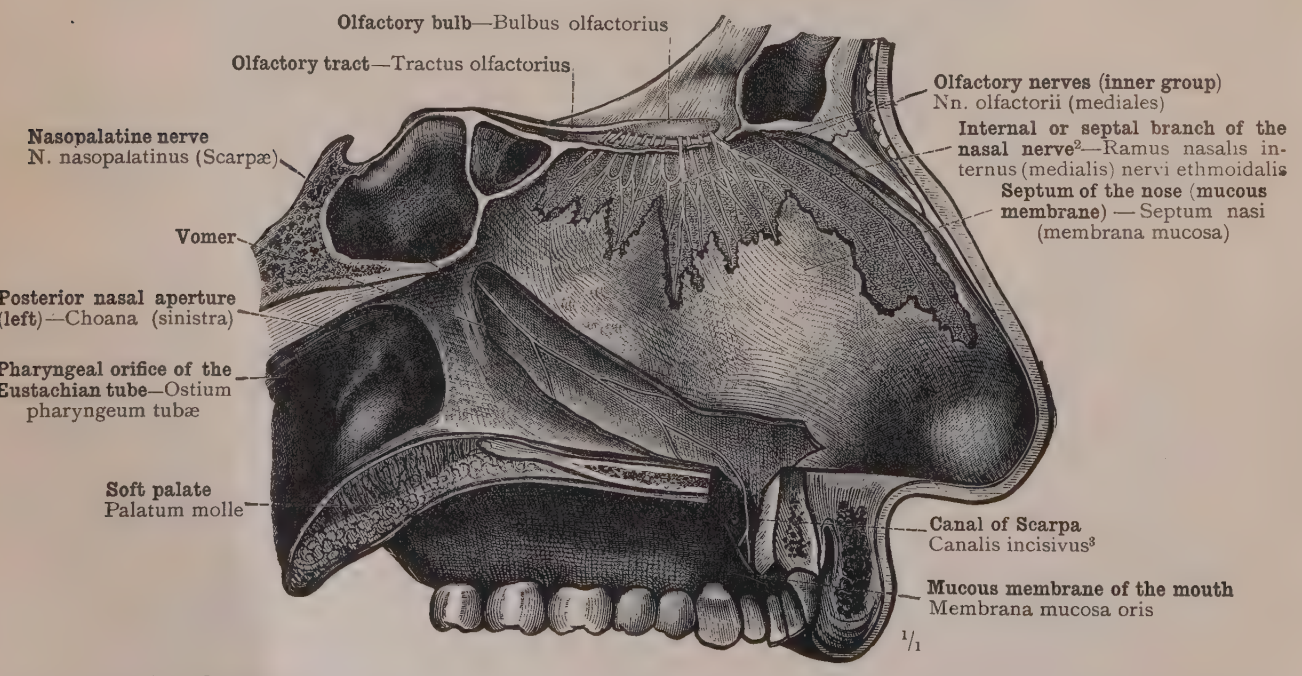
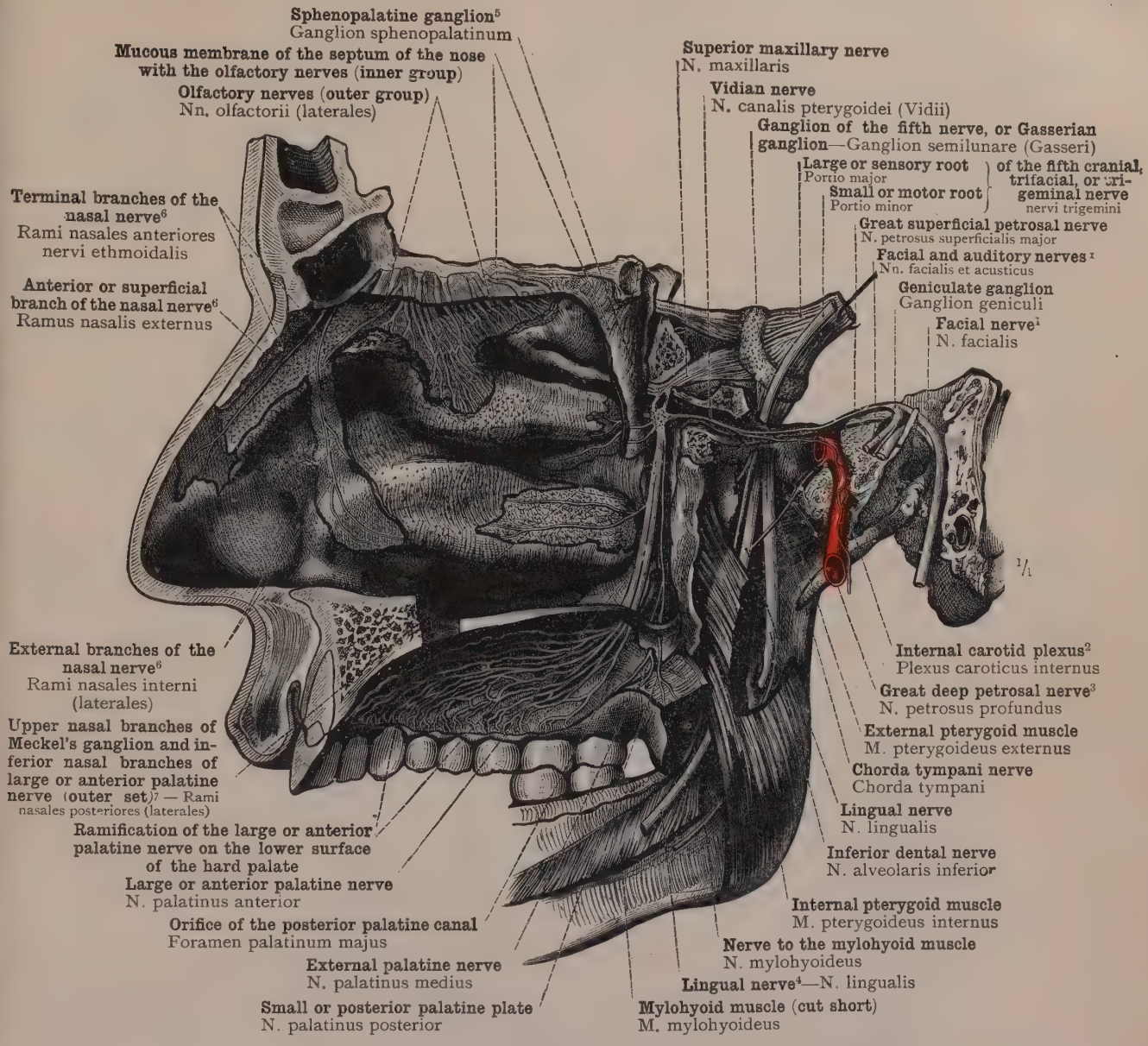

Olfactory bulb—Bulbus olfactorius
Olfactory tract—Tractus olfactorius
Olfactory nerves (inner group)
Nn. olfactorii (mediales)
Internal or septal branch of the nasal nerve[2]—Ramus nasalis internus (medialis) nervi ethmoidalis
Septum of the nose (mucous membrane) — Septum nasi (membrana mucosa)
Nasopalatine nerve
N. nasopalatinus (Scarpæ)
Vomer
Posterior nasal aperture (left)—Choana (sinistra)
Pharyngeal orifice of the Eustachian tube—Ostium pharyngeum tubæ
Soft palate
Palatum molle
Canal of Scarpa
Canalis incisivus[3]
Mucous membrane of the mouth
Membrana mucosa oris
1/1

FIG. 1302.—THE OLFACTORY NERVES, NN. OLFACTORII, THE INTERNAL OR SEPTAL BRANCH OF THE NASAL NERVE, RAMUS NASALIS INTERNUS (MEDIALIS) NERVI ETHMOIDALIS, AND THE NASOPALATINE NERVE, N. NASOPALATINUS, A BRANCH OF THE SPHENOPALATINE GANGLION (MECKEL'S GANGLION OR THE NASAL GANGLION), GANGLION SPHENOPALATINUM.

These nerves have been laid bare on the right side of the nasal septum by the partial removal of the mucous membrane.

1 Known also as *Meckel's ganglion* and as the *nasal ganglion.* 2 See Appendix, note 449. 3 See Appendix, note 451.

Trigeminus Group.—Nn. olfactorii—The olfactory nerves.


Sphenopalatine ganglion[5]
Ganglion sphenopalatinum
Mucous membrane of the septum of the nose with the olfactory nerves (inner group)
Olfactory nerves (outer group)
Nn. olfactorii (laterales)
Superior maxillary nerve
N. maxillaris
Vidian nerve
N. canalis pterygoidei (Vidii)
Ganglion of the fifth nerve, or Gasserian ganglion—Ganglion semilunare (Gasseri)
Large or sensory root
Portio major
Small or motor root
Portio minor
of the fifth cranial, trifacial, or trigeminal nerve
nervi trigemini
Great superficial petrosal nerve
N. petrosus superficialis major
Facial and auditory nerves[1]
Nn. facialis et acusticus
Geniculate ganglion
Ganglion geniculi
Facial nerve[1]
N. facialis
Terminal branches of the nasal nerve[6]
Rami nasales anteriores nervi ethmoidalis
Anterior or superficial branch of the nasal nerve[6]
Ramus nasalis externus
1/1
External branches of the nasal nerve[6]
Rami nasales interni (laterales)
Upper nasal branches of Meckel's ganglion and inferior nasal branches of large or anterior palatine nerve (outer set)[7] — Rami nasales posteriores (laterales)
Ramification of the large or anterior palatine nerve on the lower surface of the hard palate
Large or anterior palatine nerve
N. palatinus anterior
Orifice of the posterior palatine canal
Foramen palatinum majus
External palatine nerve
N. palatinus medius
Small or posterior palatine plate
N. palatinus posterior
Internal carotid plexus[2]
Plexus caroticus internus
Great deep petrosal nerve[3]
N. petrosus profundus
External pterygoid muscle
M. pterygoideus externus
Chorda tympani nerve
Chorda tympani
Lingual nerve
N. lingualis
Inferior dental nerve
N. alveolaris inferior
Internal pterygoid muscle
M. pterygoideus internus
Nerve to the mylohyoid muscle
N. mylohyoideus
Lingual nerve[4]—N. lingualis
Mylohyoid muscle (cut short)
M. mylohyoideus

[1] In Soemmerring's enumeration the *facial* is the *seventh*, the auditory the *eighth cranial nerve;* in that of Willis, the former is the *portio dura*, the latter the *portio mollis*, of the *seventh cranial nerve.*

[2] See note 3 to p. 859. [3] See Appendix, note 452. [4] Formerly known also as the *gustatory nerve.*

[5] Known also as *Meckel's ganglion*, and as the *nasal ganglion.* [6] See Appendix, note 449. [7] See Appendix, note 450.

FIG. 1303.—THE SPHENOPALATINE GANGLION (MECKEL'S GANGLION, OR THE NASAL GANGLION), GANGLION SPHENOPALATINUM. THE ROOTS OF THIS GANGLION: THE SPHENOPALATINE NERVES, NN. SPHENOPALATINI FORMING THE SENSORY ROOT; THE WHITE PORTION OF THE VIDIAN NERVE, N. CANALIS PTERYGOIDEI (VIDII), VIZ., THE GREAT SUPERFICIAL PETROSAL NERVE, N. PETROSUS SUPERFICIALIS MAJOR, FORMING THE MOTOR ROOT; AND THE GREY PORTION OF THE VIDIAN NERVE, VIZ., THE GREAT DEEP PETROSAL NERVE, N. PETROSUS PROFUNDUS, FORMING THE SYMPATHETIC ROOT. THE NASOPALATINE RADIATION OF THE SUPERIOR MAXILLARY NERVE, N. MAXILLARIS, IN THE FORM OF BRANCHES OF MECKEL'S GANGLION. THE UPPER AND LOWER (POSTERIOR) NASAL BRANCHES, RAMI NASALES POSTERIORES (*see Appendix, note* 450), AND THE PALATINE NERVES, NN. PALATINI. THE ANTERIOR OR SUPERFICIAL BRANCH, THE EXTERNAL BRANCH, AND THE INTERNAL OR SEPTAL BRANCH OF THE NASAL NERVE, RAMI NASALES ANTERIORES (LATERALES) NERVI ETHMOIDALIS. THE EMERGENCE FROM THE FORAMEN OVALE OF THE INFERIOR MAXILLARY NERVE, N. MANDIBULARIS, OR THIRD DIVISION OF THE FIFTH CRANIAL, TRIFACIAL, OR TRIGEMINAL NERVE, AND THE UNION OF THE LINGUAL NERVE WITH THE CHORDA TYMPANI NERVE. THE RAMIFICATION OF THE OLFACTORY NERVES (OUTER GROUP), NN. OLFACTORII (LATERALES), ON THE SUPERIOR AND MIDDLE TURBINATE BONES OF THE NOSE.

In the right half of a sagittally hemisected head, the tongue, the greater part of the soft palate, and the pharynx were removed; the middle portion of the base of the skull was then cut away until the carotid canal was reached, and this canal as well as the Vidian canal, the internal auditory meatus, and the aqueduct of Fallopius, were opened. The ganglion of the fifth nerve or Gasserian ganglion, ganglion semilunare, was turned outwards, in order to display the small or motor root of the trigeminal nerve, portio minor nervi trigemini, which runs along the under surface of the ganglion. Of the mucous membrane of the septum of the nose a narrow strip has been preserved, on the upper part of which the olfactory nerves of the inner group are visible.

Trigeminus Group.—Nn. olfactorii—The olfactory nerves.

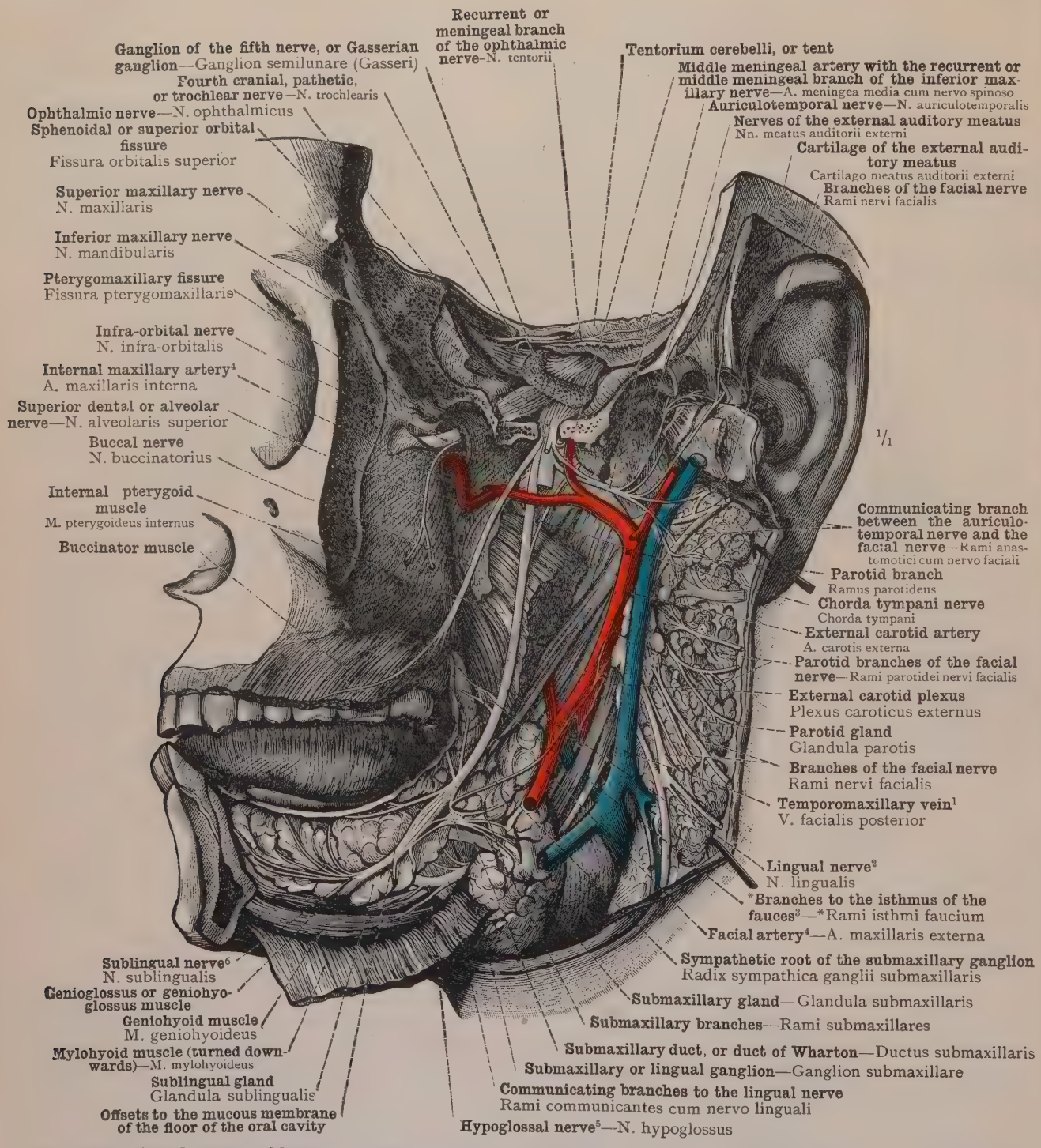
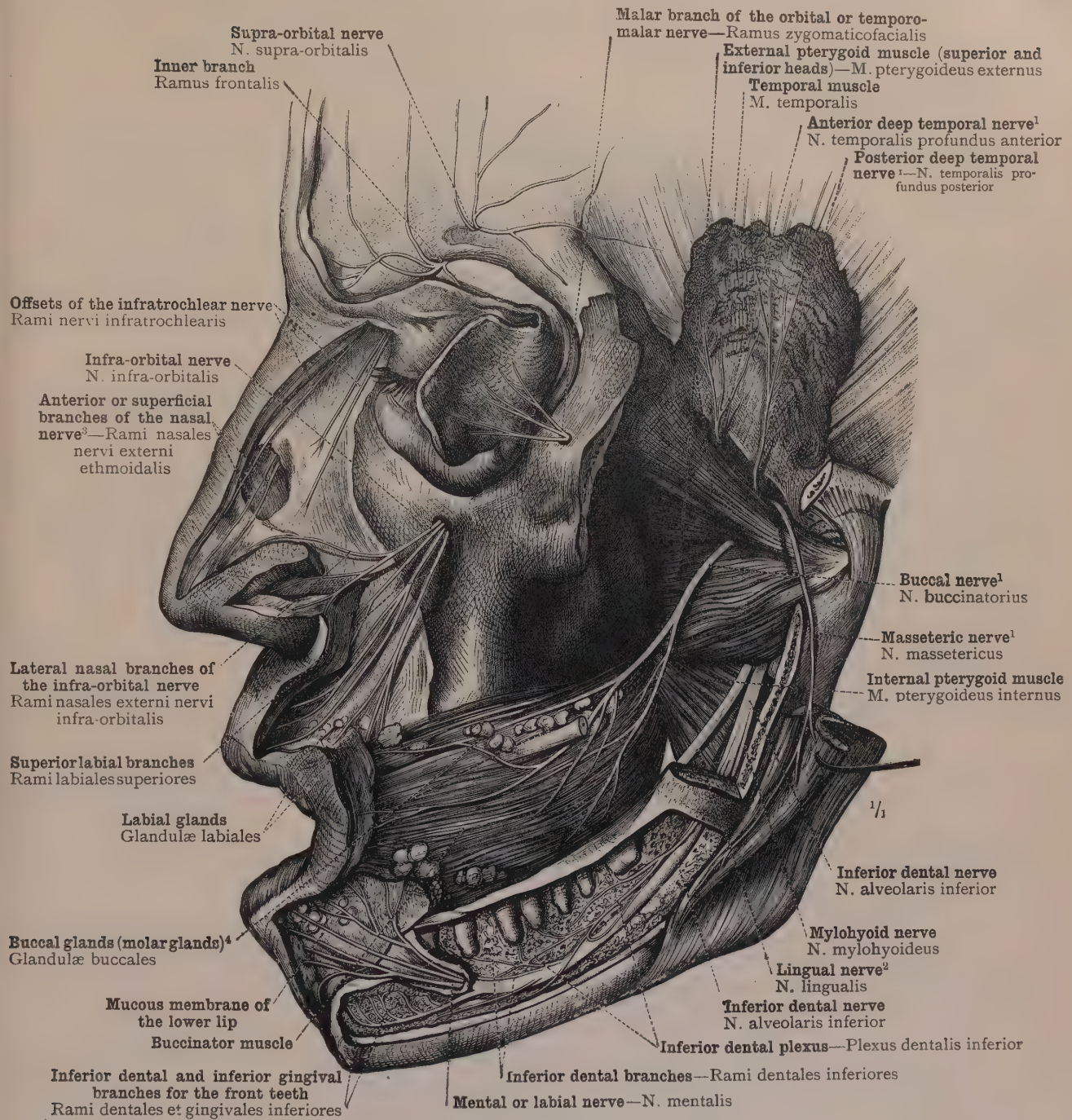

Recurrent or meningeal branch of the ophthalmic nerve—N. tentorii
Ganglion of the fifth nerve, or Gasserian ganglion—Ganglion semilunare (Gasseri)
Fourth cranial, pathetic, or trochlear nerve—N. trochlearis
Ophthalmic nerve—N. ophthalmicus
Sphenoidal or superior orbital fissure
Fissura orbitalis superior
Superior maxillary nerve
N. maxillaris
Inferior maxillary nerve
N. mandibularis
Pterygomaxillary fissure
Fissura pterygomaxillaris
Infra-orbital nerve
N. infra-orbitalis
Internal maxillary artery[4]
A. maxillaris interna
Superior dental or alveolar nerve—N. alveolaris superior
Buccal nerve
N. buccinatorius
Internal pterygoid muscle
M. pterygoideus internus
Buccinator muscle
Tentorium cerebelli, or tent
Middle meningeal artery with the recurrent or middle meningeal branch of the inferior maxillary nerve—A. meningea media cum nervo spinoso
Auriculotemporal nerve—N. auriculotemporalis
Nerves of the external auditory meatus
Nn. meatus auditorii externi
Cartilage of the external auditory meatus
Cartilago meatus auditorii externi
Branches of the facial nerve
Rami nervi facialis
1/1
Communicating branch between the auriculotemporal nerve and the facial nerve—Rami anastomotici cum nervo faciali
Parotid branch
Ramus parotideus
Chorda tympani nerve
Chorda tympani
External carotid artery
A. carotis externa
Parotid branches of the facial nerve—Rami parotidei nervi facialis
External carotid plexus
Plexus caroticus externus
Parotid gland
Glandula parotis
Branches of the facial nerve
Rami nervi facialis
Temporomaxillary vein[1]
V. facialis posterior
Lingual nerve[2]
N. lingualis
*Branches to the isthmus of the fauces[3]—*Rami isthmi faucium
Facial artery[4]—A. maxillaris externa
Sympathetic root of the submaxillary ganglion
Radix sympathica ganglii submaxillaris
Submaxillary gland—Glandula submaxillaris
Submaxillary branches—Rami submaxillares
Submaxillary duct, or duct of Wharton—Ductus submaxillaris
Submaxillary or lingual ganglion—Ganglion submaxillare
Communicating branches to the lingual nerve
Rami communicantes cum nervo linguali
Hypoglossal nerve[5]—N. hypoglossus
Sublingual nerve[6]
N. sublingualis
Genioglossus or geniohyoglossus muscle
Geniohyoid muscle
M. geniohyoideus
Mylohyoid muscle (turned downwards)—M. mylohyoideus
Sublingual gland
Glandula sublingualis
Offsets to the mucous membrane of the floor of the oral cavity

FIG 1304.—THE INFERIOR MAXILLARY NERVE, N. MANDIBULARIS, OR THIRD DIVISION OF THE FIFTH CRANIAL, TRIFACIAL, OR TRIGEMINAL NERVE, N. TRIGEMINUS. ITS MOTOR BRANCHES AND ALSO THE INFERIOR DENTAL OR ALVEOLAR NERVE, N. ALVEOLARIS INFERIOR, HAVE BEEN CUT SHORT CLOSE TO THE BASE OF THE SKULL.

On the left side of the head in front of the ear the parotid gland was removed through a vertical incision, the left half of the inferior maxillary bone was taken away, and between the malar bone and the external auditory meatus a wedge-shaped piece of the base of the skull, the apex of which was at the foramen ovale, was removed by two saw-cuts. The hinder portion of the parotid gland has been turned backwards with the superimposed skin.

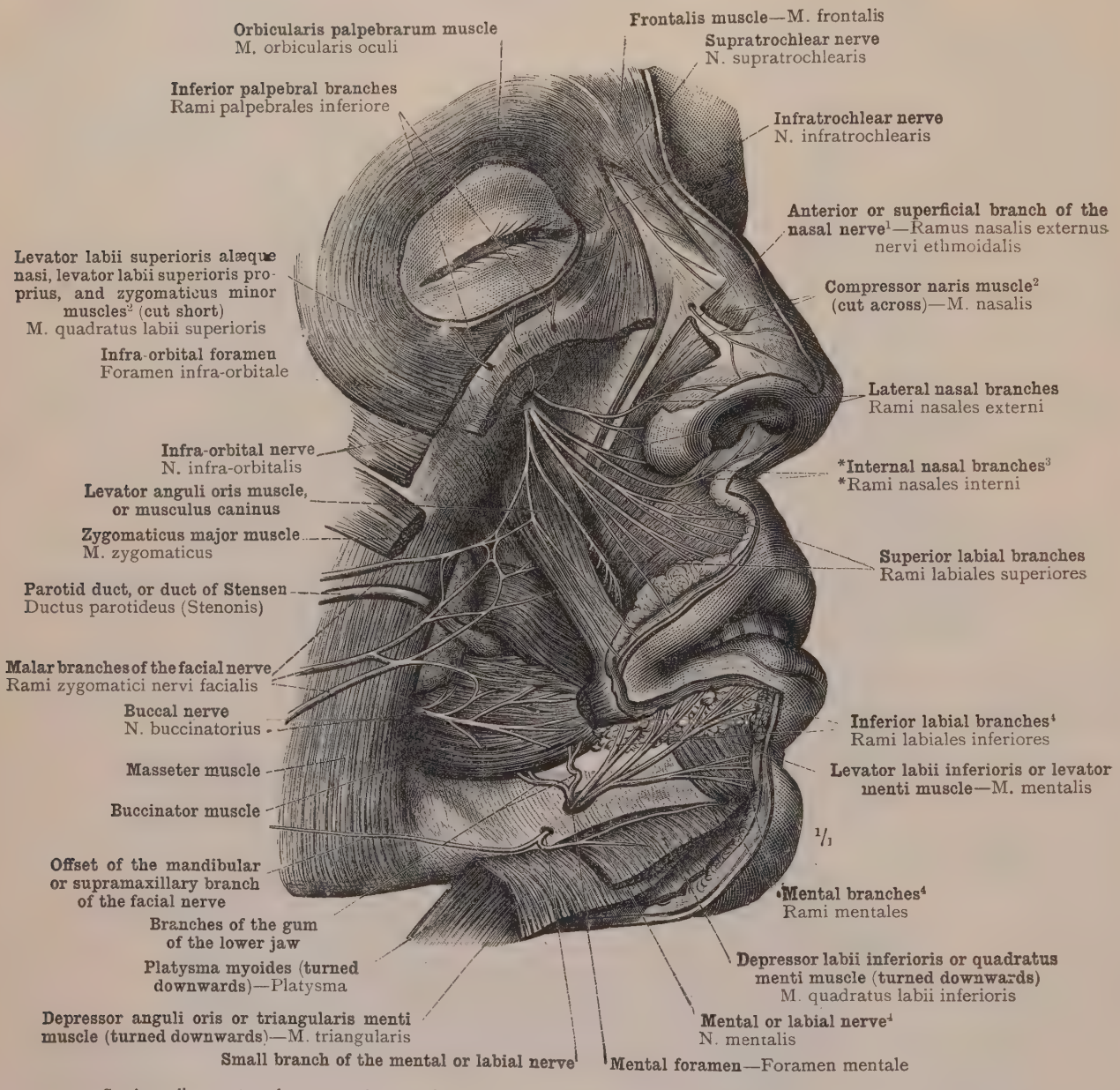
1 Sometimes called the *posterior facial vein*. See Appendix to Part V., note 283.
2 Formerly known also as the *gustatory nerve*.
3 Neither in the nomenclature of Quain nor in that of Macalister are the **branches to the isthmus of the fauces* distinguished by name from the other branches furnished by the lingual nerve to the mucous membrane of the mouth.
4 See Appendix to Part V., note 166.
5 *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth cranial nerve* in that of Willis; sometimes also known as the *lingual motor nerve*.
6 See Appendix, note 453.



[1] See Appendix, note 454. [2] Formerly known also as the *gustatory nerve*.
[3] See Appendix, note 449 and note 7 to p. 859. [4] See note [1] to p. 413, in Part IV.

FIG. 1305.—THE INFERIOR DENTAL NERVE, N. ALVEOLARIS INFERIOR; ITS COURSE THROUGH THE MANDIBULAR OR INFERIOR DENTAL CANAL, WITH THE INFERIOR DENTAL PLEXUS, PLEXUS DENTALIS INFERIOR, AND ITS TERMINAL BRANCH, THE MENTAL OR LABIAL NERVE, N. MENTALIS. THE BUCCAL NERVE N. BUCCINATORIUS. OF THE MOTOR BRANCHES OF THE INFERIOR MAXILLARY NERVE, N. MANDIBULARIS, THE ANTERIOR AND POSTERIOR DEEP TEMPORAL NERVES, NN. TEMPORALES PROFUNDI ANTERIOR ET POSTERIOR (*see Appendix, note* 454), AND THE MASSETERIC NERVE, N. MASSETERICUS, ARE SEEN. THE MALAR BRANCH OF THE ORBITAL OR TEMPOROMALAR NERVE, RAMUS ZYGOMATICOFACIALIS NERVI ZYGOMATICI; THE SUPERIOR LABIAL AND LATERAL NASAL BRANCHES OF THE INFRA-ORBITAL NERVE, RAMI LABIALES SUPERIORES ET RAMI NASALES EXTERNI NERVI INFRA-ORBITALIS; AND THE ANTERIOR OR SUPERFICIAL BRANCHES OF THE NASAL NERVE, RAMI NASALES EXTERNI NERVI ETHMOIDALIS. THE BRANCHES OF THE OPHTHALMIC NERVE TO THE SKIN OF THE FRONTAL REGION.

The parts were exposed by the removal of the zygomatic arch, the front of the ramus of the inferior maxillary bone, and the outer compact lamella of the body of that bone. In order to display the deep temporal nerves, the lower part of the temporal muscle was cut away.


Orbicularis palpebrarum muscle
M. orbicularis oculi
Frontalis muscle—M. frontalis
Supratrochlear nerve
N. supratrochlearis
Inferior palpebral branches
Rami palpebrales inferiore
Infratrochlear nerve
N. infratrochlearis
Anterior or superficial branch of the nasal nerve[1]—Ramus nasalis externus nervi ethmoidalis
Levator labii superioris alæque nasi, levator labii superioris proprius, and zygomaticus minor muscles[2] (cut short)
M. quadratus labii superioris
Compressor naris muscle[2] (cut across)—M. nasalis
Infra-orbital foramen
Foramen infra-orbitale
Lateral nasal branches
Rami nasales externi
Infra-orbital nerve
N. infra-orbitalis
*Internal nasal branches[3]
*Rami nasales interni
Levator anguli oris muscle, or musculus caninus
Zygomaticus major muscle
M. zygomaticus
Superior labial branches
Rami labiales superiores
Parotid duct, or duct of Stensen
Ductus parotideus (Stenonis)
Malar branches of the facial nerve
Rami zygomatici nervi facialis
Buccal nerve
N. buccinatorius
Inferior labial branches[4]
Rami labiales inferiores
Masseter muscle
Levator labii inferioris or levator menti muscle—M. mentalis
Buccinator muscle
1/1
Offset of the mandibular or supramaxillary branch of the facial nerve
Mental branches[4]
Rami mentales
Branches of the gum of the lower jaw
Platysma myoides (turned downwards)—Platysma
Depressor labii inferioris or quadratus menti muscle (turned downwards)
M. quadratus labii inferioris
Depressor anguli oris or triangularis menti muscle (turned downwards)—M. triangularis
Mental or labial nerve[4]
N. mentalis
Small branch of the mental or labial nerve
Mental foramen—Foramen mentale

[1] See Appendix, note 449 and note 7 to p. 859. [2] See note 1 to p. 303, in Part III. [3] See Appendix, note 455. [4] See Appendix, note 456.

FIG. 1306.—PART OF THE FACIAL RADIATION OF THE SUPERIOR MAXILLARY NERVE, N. MAXILLARIS (THE INFRA-ORBITAL PLEXUS), WITH THE CUTANEOUS NERVES OF THE NOSE AND THE NERVES OF THE UPPER AND LOWER LIPS: THE BRANCHES OF THE INFRA-ORBITAL NERVE TO THE SKIN OF THE CHEEK, THE ALA OF THE NOSE, THE SEPTUM OF THE NOSE, AND THE LOWER LID: SUPERIOR LABIAL BRANCHES (RAMI LABIALES SUPERIORES), LATERAL NASAL AND *INTERNAL NASAL BRANCHES (RAMI NASALES EXTERNI ET INTERNI—*see Appendix, notes* 449, 456, *and note* 7 *to p.* 859), AND INFERIOR PALPEBRAL BRANCHES (RAMI PALPEBRALES INFERIORES). THE COMMUNICATIONS BETWEEN THESE NERVES AND THE BRANCHES OF THE FACIAL NERVE. THE DISTRIBUTION OF THE SUPRATROCHLEAR NERVE, N. SUPRATROCHLEARIS, AND THE INFRATROCHLEAR NERVE, N. INFRATROCHLEARIS, BRANCHES OF THE FIRST DIVISION OF THE FIFTH NERVE; AND THE TERMINAL RAMIFICATION OF THE BUCCAL NERVE, N. BUCCINATORIUS, AND THE MENTAL OR LABIAL NERVE, N. MENTALIS, BRANCHES OF THE THIRD DIVISION OF THE FIFTH NERVE. A SMALL BRANCH OF THE MENTAL NERVE WHICH EMERGES FROM THE INFERIOR MAXILLARY BONE BY A SPECIAL APERTURE IS SEEN TO COMMUNICATE WITH THE MANDIBULAR OR SUPRAMAXILLARY BRANCH OF THE FACIAL NERVE.

Preparation of the right side of the face after removing the skin and the superficial layer of the muscles of the face. The compressor naris muscle has been cut across, in order to display the emergence on to the outer surface of the nose of the anterior or superficial branch of the nasal nerve (ramus nasalis externus nervi nasociliaris).

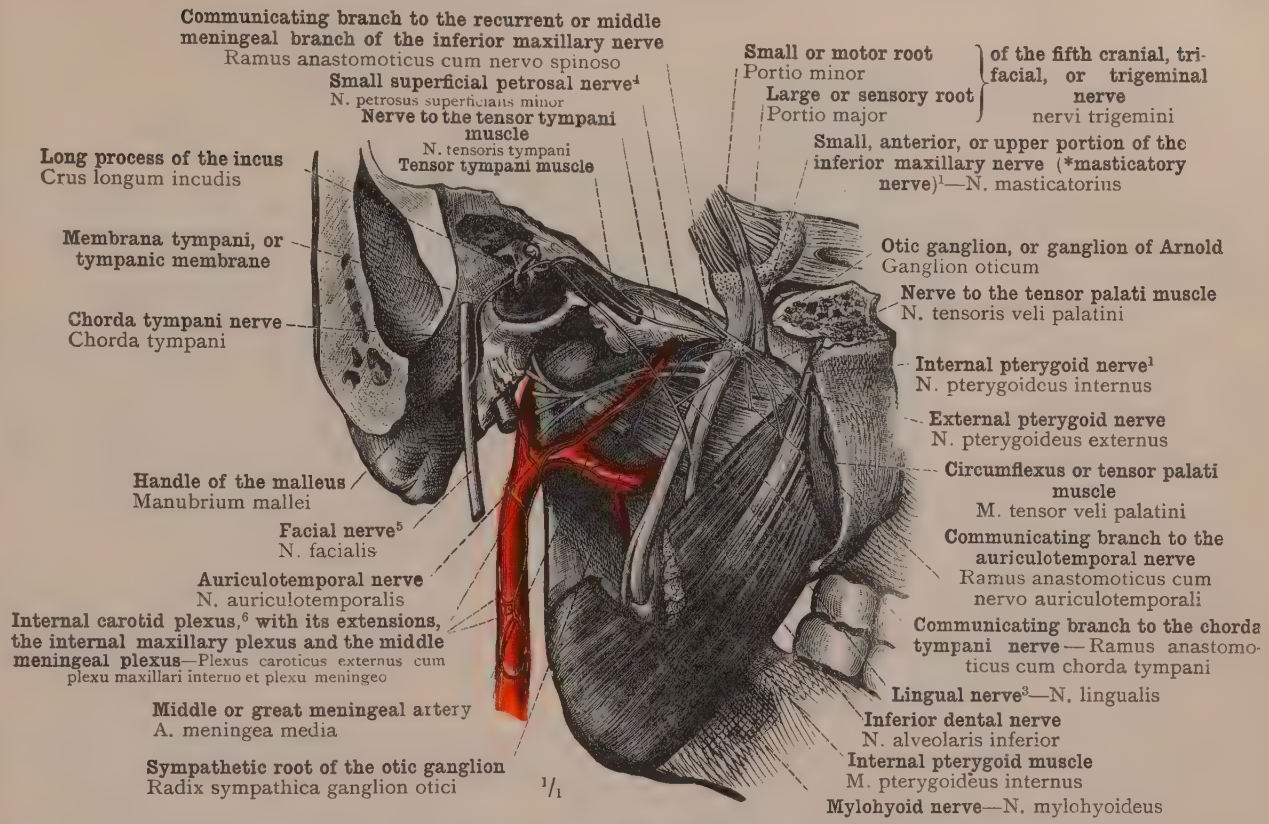

Communicating branch to the recurrent or middle meningeal branch of the inferior maxillary nerve
Ramus anastomoticus cum nervo spinoso
Small superficial petrosal nerve[4]
N. petrosus superficialis minor
Nerve to the tensor tympani muscle
N. tensoris tympani
Tensor tympani muscle
Long process of the incus
Crus longum incudis
Membrana tympani, or tympanic membrane
Chorda tympani nerve
Chorda tympani
Handle of the malleus
Manubrium mallei
Facial nerve[5]
N. facialis
Auriculotemporal nerve
N. auriculotemporalis
Internal carotid plexus,[6] with its extensions, the internal maxillary plexus and the middle meningeal plexus—Plexus caroticus externus cum plexu maxillari interno et plexu meningeo
Middle or great meningeal artery
A. meningea media
Sympathetic root of the otic ganglion
Radix sympathica ganglion otici
1/1
Small or motor root
Portio minor
Large or sensory root
Portio major
of the fifth cranial, trifacial, or trigeminal nerve
nervi trigemini
Small, anterior, or upper portion of the inferior maxillary nerve (*masticatory nerve)[1]—N. masticatorius
Otic ganglion, or ganglion of Arnold
Ganglion oticum
Nerve to the tensor palati muscle
N. tensoris veli palatini
Internal pterygoid nerve[1]
N. pterygoideus internus
External pterygoid nerve
N. pterygoideus externus
Circumflexus or tensor palati muscle
M. tensor veli palatini
Communicating branch to the auriculotemporal nerve
Ramus anastomoticus cum nervo auriculotemporali
Communicating branch to the chorda tympani nerve—Ramus anastomoticus cum chorda tympani
Lingual nerve[3]—N. lingualis
Inferior dental nerve
N. alveolaris inferior
Internal pterygoid muscle
M. pterygoideus internus
Mylohyoid nerve—N. mylohyoideus

FIG. 1307.—THE OTIC GANGLION OR GANGLION OF ARNOLD, GANGLION OTICUM; ITS ROOTS AND BRANCHES. DISPLAYED ON THE LEFT SIDE OF THE HEAD, AND VIEWED FROM WITHIN.

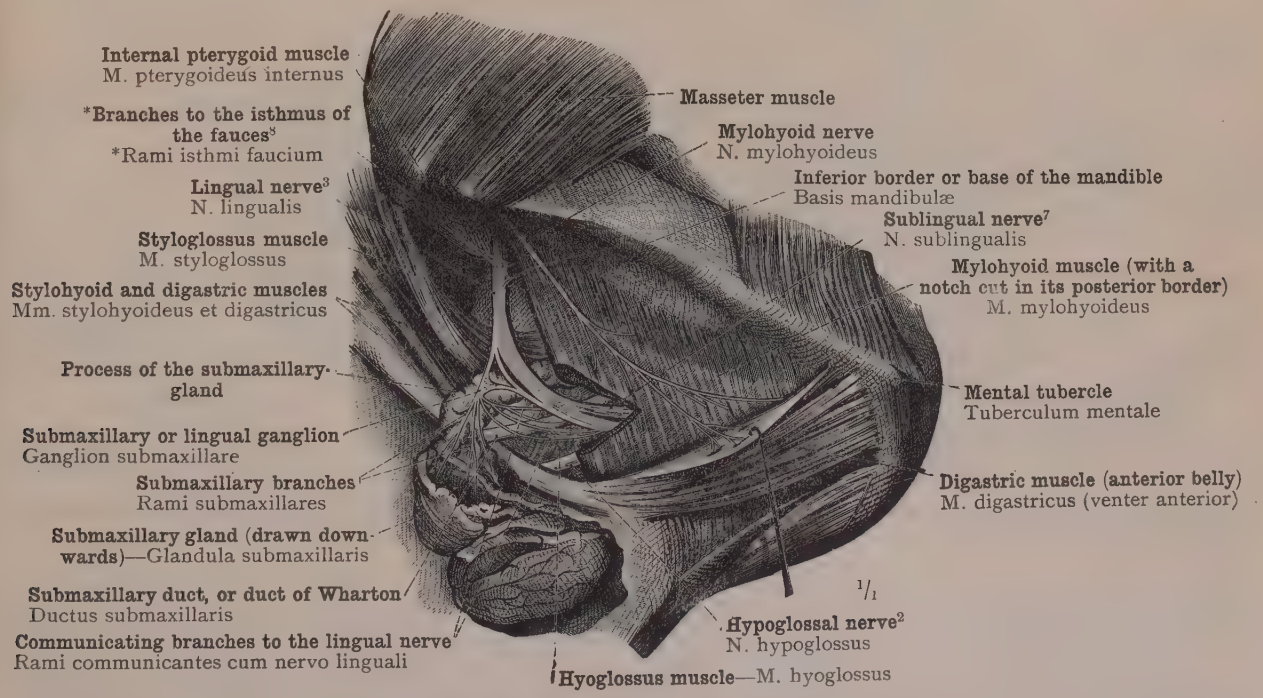


FIG. 1308.—THE SUBMAXILLARY OR LINGUAL GANGLION, GANGLION SUBMAXILLARE, AND ITS BRANCHES, WITH THE MYLOHYOID NERVE, DISPLAYED IN THE RIGHT SUBMAXILLARY REGION. SEEN OBLIQUELY FROM BELOW.

The submaxillary gland has been shelled out of its bed and drawn downwards.

1 See Appendix, note 457.
2 *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; known also as the *lingual motor nerve.*
3 Formerly known also as the *gustatory nerve.*
4 By Arnold called the *long root of the otic ganglion* See also Appendix, note 452.
5 *Seventh cranial nerve* in Soemmerring's enumeration; *portio dura* of the *seventh cranial nerve* in that of Willis.
6 See note 3 to p. 859. 7 See Appendix, note 453. 8 See note 3 to p. 864.

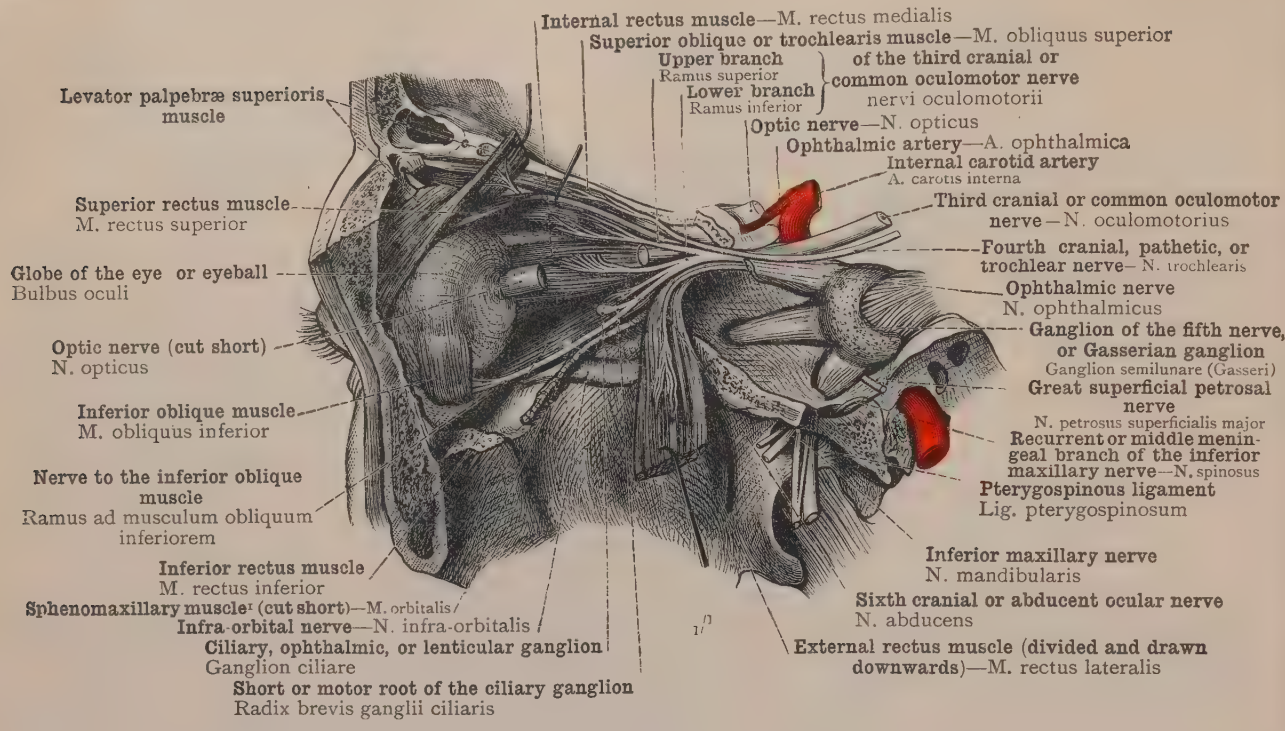

Internal rectus muscle—M. rectus medialis
Superior oblique or trochlearis muscle—M. obliquus superior
Upper branch
Ramus superior
Lower branch
Ramus inferior
of the third cranial or common oculomotor nerve
nervi oculomotorii
Optic nerve—N. opticus
Ophthalmic artery—A. ophthalmica
Internal carotid artery
A. carotis interna
Levator palpebræ superioris muscle
Superior rectus muscle
M. rectus superior
Third cranial or common oculomotor nerve—N. oculomotorius
Fourth cranial, pathetic, or trochlear nerve—N. trochlearis
Globe of the eye or eyeball
Bulbus oculi
Ophthalmic nerve
N. ophthalmicus
Ganglion of the fifth nerve, or Gasserian ganglion
Ganglion semilunare (Gasseri)
Optic nerve (cut short)
N. opticus
Great superficial petrosal nerve
N. petrosus superficialis major
Inferior oblique muscle
M. obliquus inferior
Recurrent or middle meningeal branch of the inferior maxillary nerve—N. spinosus
Pterygospinous ligament
Lig. pterygospinosum
Nerve to the inferior oblique muscle
Ramus ad musculum obliquum inferiorem
Inferior maxillary nerve
N. mandibularis
Inferior rectus muscle
M. rectus inferior
Sixth cranial or abducent ocular nerve
N. abducens
Sphenomaxillary muscle[1] (cut short)—M. orbitalis
Infra-orbital nerve—N. infra-orbitalis
Ciliary, ophthalmic, or lenticular ganglion
Ganglion ciliare
External rectus muscle (divided and drawn downwards)—M. rectus lateralis
Short or motor root of the ciliary ganglion
Radix brevis ganglii ciliaris
1/1

FIG. 1309.—THE NERVES OF THE EXTERNAL MUSCLES OF THE EYE: THIRD CRANIAL OR COMMON OCULOMOTOR NERVE, N. OCULOMOTORIUS, FOURTH CRANIAL, PATHETIC, OR TROCHLEAR NERVE, N. TROCHLEARIS, AND SIXTH CRANIAL OR ABDUCENT OCULAR NERVE, N. ABDUCENS, DISPLAYED BY THE REMOVAL OF THE OUTER AND UPPER WALLS OF THE LEFT ORBIT.

The levator palpebræ superioris and external rectus muscles have been cut across and turned aside.

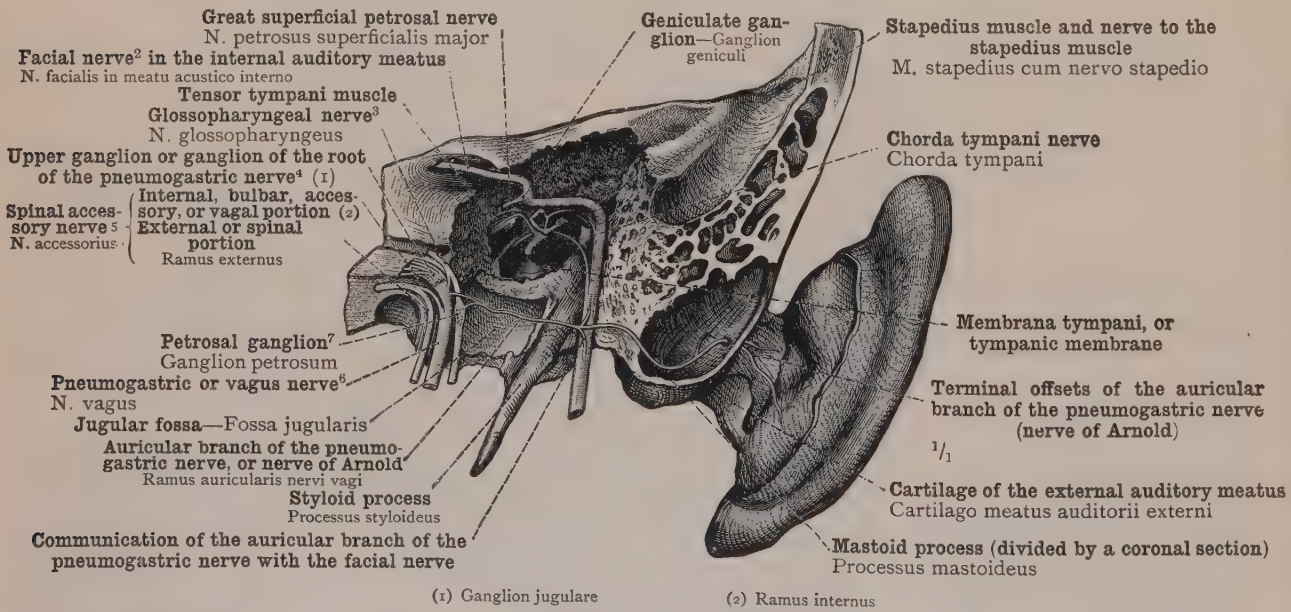

Great superficial petrosal nerve
N. petrosus superficialis major
Geniculate ganglion—Ganglion geniculi
Stapedius muscle and nerve to the stapedius muscle
M. stapedius cum nervo stapedio
Facial nerve[2] in the internal auditory meatus
N. facialis in meatu acustico interno
Tensor tympani muscle
Glossopharyngeal nerve[3]
N. glossopharyngeus
Chorda tympani nerve
Chorda tympani
Upper ganglion or ganglion of the root of the pneumogastric nerve[4] (1)
Spinal accessory nerve[5]
N. accessorius
Internal, bulbar, accessory, or vagal portion (2)
External or spinal portion
Ramus externus
Membrana tympani, or tympanic membrane
Petrosal ganglion[7]
Ganglion petrosum
Terminal offsets of the auricular branch of the pneumogastric nerve (nerve of Arnold)
Pneumogastric or vagus nerve[6]
N. vagus
1/1
Jugular fossa—Fossa jugularis
Auricular branch of the pneumogastric nerve, or nerve of Arnold
Ramus auricularis nervi vagi
Cartilage of the external auditory meatus
Cartilago meatus auditorii externi
Styloid process
Processus styloideus
Communication of the auricular branch of the pneumogastric nerve with the facial nerve
Mastoid process (divided by a coronal section)
Processus mastoideus
(1) Ganglion jugulare
(2) Ramus internus

FIG. 1310.—THE FACIAL NERVE, N. FACIALIS (*see note* [2] *below*); ITS COURSE THROUGH THE AQUEDUCT OF FALLOPIUS, WITH THE BRANCHES SUPPLIED BY THE NERVE DURING THIS PART OF ITS COURSE; DISPLAYED FROM BEHIND IN THE RIGHT PETROUS BONE. THE AURICULAR BRANCH OF THE PNEUMOGASTRIC NERVE OR NERVE OF ARNOLD, RAMUS AURICULARIS NERVI VAGI, AND THE COMMUNICATION BETWEEN THE GLOSSOPHARYNGEAL NERVE, N. GLOSSOPHARYNGEUS, AND THE AURICULAR BRANCH OF THE PNEUMOGASTRIC NERVE BY MEANS OF THE RAMUS ANASTOMOTICUS CUM RAMO AURICULARI NERVI VAGI.

1 See Appendix, note 458.
2 *Seventh cranial nerve* in Soemmerring's enumeration; *portio dura* of the *seventh cranial nerve* in that of Willis.
3 *Ninth cranial nerve* in Soemmerring's enumeration; *first trunk* of the *eighth cranial nerve* in that of Willis.
4 See Appendix, note 447.
5 *Eleventh cranial nerve* in Soemmerring's enumeration; *third trunk* of the *eighth cranial nerve* in that of Willis.
6 *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.
7 Also known as *Andersch's ganglion.*

Trigeminus Group.—Auricular Branch of the Pneumogastric Nerve, or Nerve of Arnold, Ramus Auricularis Nervi Vagi.

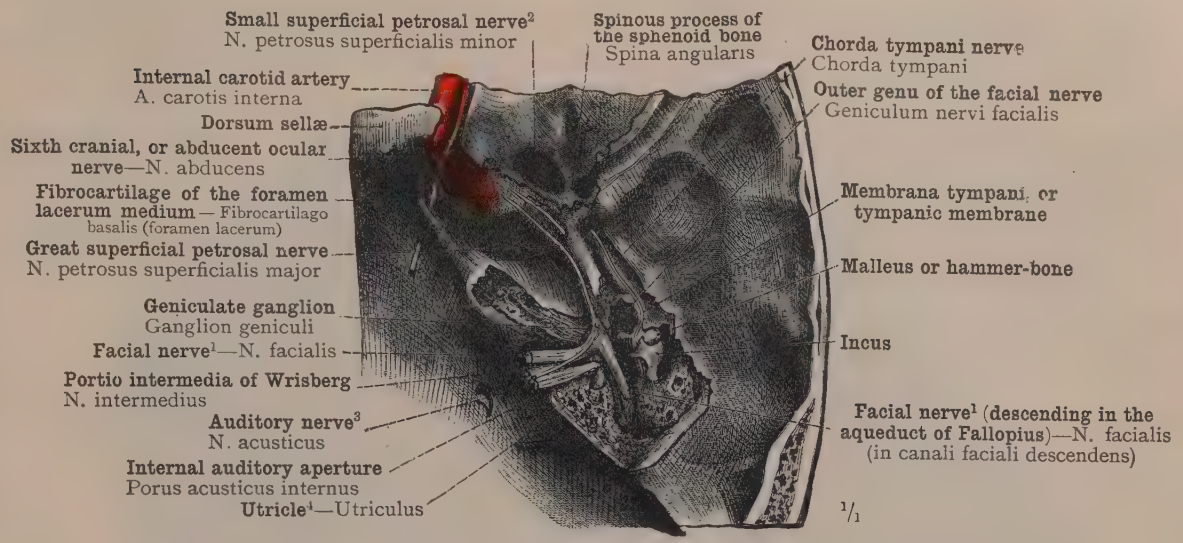


FIG. 1311.—THE CHORDA TYMPANI NERVE, CHORDA TYMPANI, AND THE GREAT SUPERFICIAL PETROSAL NERVE, N. PETROSUS SUPERFICIALIS MAJOR, DISPLAYED FROM ABOVE IN THE REGION OF THE RIGHT PETROUS BONE, THE TYMPANIC CAVITY OR TYMPANUM AND THE INTERNAL AUDITORY MEATUS HAVING BEEN OPENED UP. THE PORTIO INTERMEDIA OF WRISBERG, N. INTERMEDIUS, AND THE GENICULATE GANGLION, GANGLION GENICULI.

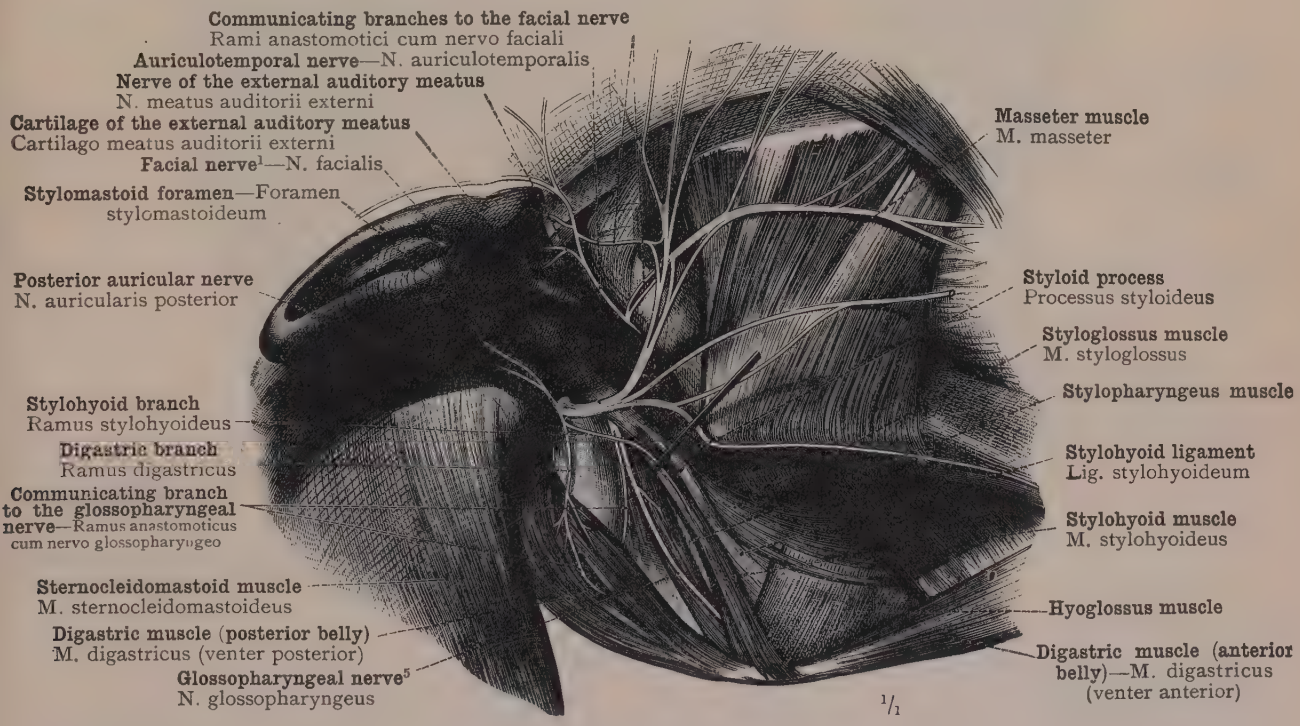


FIG. 1312.—THE EMERGENCE OF THE FACIAL NERVE, N. FACIALIS (*see note* [1] *below*), FROM THE STYLOMASTOID FORAMEN, FORAMEN STYLOMASTOIDEUM, ITS RAMIFICATION IN THE RETROMANDIBULAR FOSSA, FOSSA RETROMANDIBULARIS, AND ITS COMMUNICATING BRANCHES TO THE GLOSSOPHARYNGEAL NERVE, N. GLOSSOPHARYNGEUS, AND THE AURICULOTEMPORAL NERVE, N. AURICULOTEMPORALIS, DISPLAYED ON THE RIGHT SIDE OF THE HEAD BY THE COMPLETE REMOVAL OF THE PAROTID GLAND. THE COMMUNICATING BRANCH BETWEEN THE FACIAL NERVE AND THE GLOSSOPHARYNGEAL NERVE HAS THE FORM OF A LOOP, WHICH PERFORATES THE POSTERIOR BELLY OF THE DIGASTRIC MUSCLE. SEEN OBLIQUELY FROM BELOW.

1 *Seventh cranial nerve* in Soemmerring's enumeration ; *portio dura* of the *seventh cranial nerve* in that of Willis.
2 By Arnold called the *long root of the ciliary ganglion.*
3 *Eighth cranial nerve* in Soemmerring's enumeration ; *portio mollis* of the *seventh cranial nerve* in that of Willis.
4 Known also as the *common sinus* of the membranous semicircular canals.
5 *Ninth cranial nerve* in Soemmerring's enumeration ; *first trunk* of the *eighth cranial nerve* in that of Willis.

Trigeminus Group.

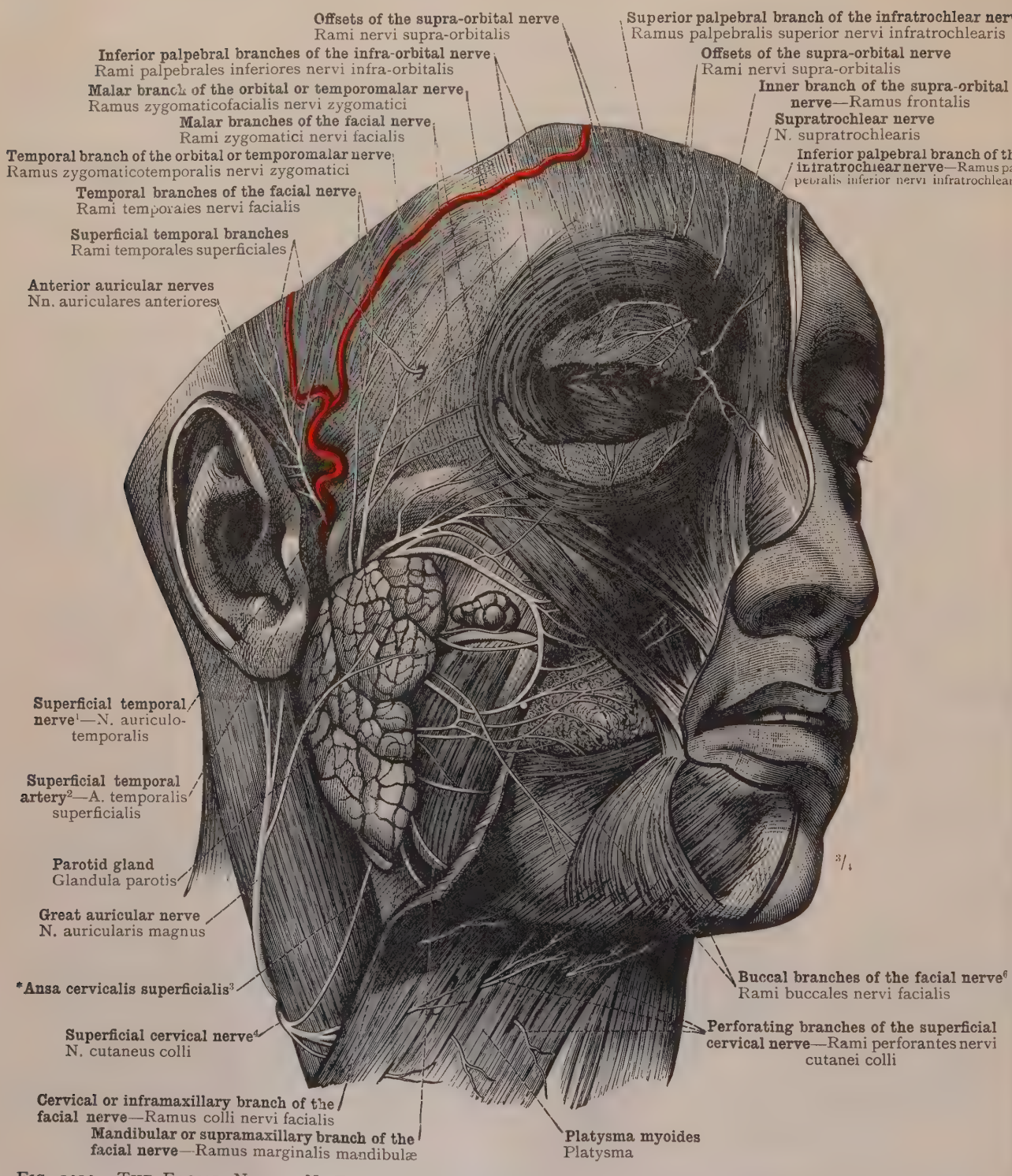

Offsets of the supra-orbital nerve
Rami nervi supra-orbitalis
Superior palpebral branch of the infratrochlear nerve
Ramus palpebralis superior nervi infratrochlearis
Inferior palpebral branches of the infra-orbital nerve
Rami palpebrales inferiores nervi infra-orbitalis
Offsets of the supra-orbital nerve
Rami nervi supra-orbitalis
Malar branch of the orbital or temporomalar nerve
Ramus zygomaticofacialis nervi zygomatici
Inner branch of the supra-orbital nerve—Ramus frontalis
Malar branches of the facial nerve
Rami zygomatici nervi facialis
Supratrochlear nerve
N. supratrochlearis
Temporal branch of the orbital or temporomalar nerve
Ramus zygomaticotemporalis nervi zygomatici
Inferior palpebral branch of the infratrochlear nerve—Ramus palpebralis inferior nervi infratrochlearis
Temporal branches of the facial nerve
Rami temporales nervi facialis
Superficial temporal branches
Rami temporales superficiales
Anterior auricular nerves
Nn. auriculares anteriores
Superficial temporal nerve[1]—N. auriculo-temporalis
Superficial temporal artery[2]—A. temporalis superficialis
Parotid gland
Glandula parotis
Great auricular nerve
N. auricularis magnus
*Ansa cervicalis superficialis[3]
Superficial cervical nerve[4]
N. cutaneus colli
Cervical or inframaxillary branch of the facial nerve—Ramus colli nervi facialis
Mandibular or supramaxillary branch of the facial nerve—Ramus marginalis mandibulæ
Buccal branches of the facial nerve[6]
Rami buccales nervi facialis
Perforating branches of the superficial cervical nerve—Rami perforantes nervi cutanei colli
Platysma myoides
Platysma
3/4

FIG. 1313.—THE FACIAL NERVE, N. FACIALIS; ITS BRANCHES AS FAR AS THEY ARE VISIBLE WHEN THE PAROTID GLAND, THE SUPERFICIAL MUSCLES OF THE FACE, AND THE BUCCAL FAT-PAD, CORPUS ADIPOSUM BUCCÆ (*see note 5 below*), ARE LEFT INTACT. RIGHT SIDE OF THE FACE. THE BRANCHES OF THE CERVICAL PLEXUS AND OF THE OPHTHALMIC NERVE, OR FIRST DIVISION OF THE FIFTH CRANIAL NERVE, TO THE FACE AND THE UPPER PART OF THE NECK; OF THE FACIAL BRANCHES OF THE SUPERIOR MAXILLARY NERVE, OR SECOND DIVISION OF THE FIFTH CRANIAL NERVE, THOSE OF THE ORBITAL OR TEMPOROMALAR NERVE, N. ZYGOMATICUS, HAVE ALONE BEEN PRESERVED.

In order to expose the course of the nerves supplying the eyelids, a part of the orbicularis palpebrarum muscle, musculus orbicularis oculi, which covers these nerves has been cut away.

[1] See Appendix, note 459. [2] See Appendix to Part V., note 168. [3] See Appendix, note 400.
[4] By Macalister called the *superficialis colli nerve*.
[5] The *buccal fat-pad* is sometimes, but inappropriately, named the *sucking-pad*.
[6] Also called *inferior buccolabial branches of the facial nerve*.

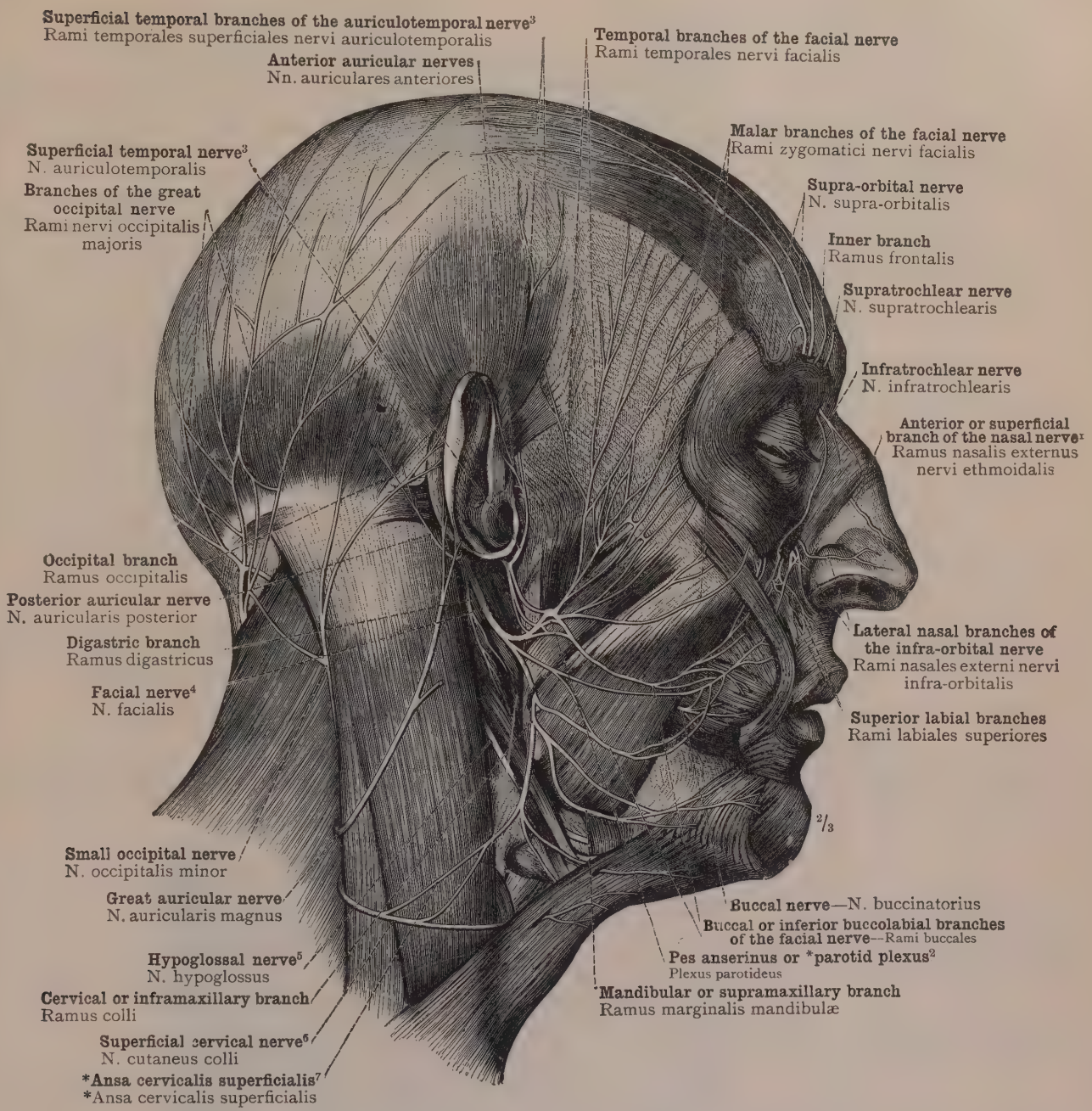


FIG. 1314.—THE RAMIFICATION OF THE FACIAL NERVE, N. FACIALIS (*see note* [4] *below*), DISPLAYED BY THE REMOVAL OF THE PAROTID GLAND AND SOME OF THE SUPERFICIAL MUSCLES OF THE FACE. RIGHT SIDE OF THE FACE. THE COMMUNICATING BRANCHES FROM THE FACIAL NERVE TO THE AURICULOTEMPORAL NERVE, TO THE INFRA-ORBITAL NERVE, AND TO THE SUPERFICIAL CERVICAL NERVE (*see note* [6] *below*). THE SENSORY NERVES OF THE FRONTAL REGION, OF THE SKIN OF THE NOSE, AND OF THE PINNA OR AURICLE; THE RAMIFICATION OF THE GREAT AND SMALL OCCIPITAL NERVES, NN. OCCIPITALES, MAJOR ET MINOR, ON THE BACK OF THE HEAD.

The upper part of the orbicularis palpebrarum muscle, musculus orbicularis oculi, and the lower part of the frontalis muscle, musculus frontalis, have been removed, in order to display the branches of the frontal nerve, nervus frontalis, emerging from the orbit. The upper and back portions of the platysma myoides have also been removed, in order to display the communication between the facial nerve and the superficial cervical nerve (*ansa cervicalis superficialis—*see Appendix, note* 460), and also the cervical or inframaxillary branch of the facial nerve. This latter branch has been drawn out of the interior of the retromandibular fossa by means of a hook.

[1] See Appendix, note 449 and note 7 to p 859. [2] See Appendix, note 461. [3] See Appendix, note 459.
[4] *Seventh cranial nerve* in Soemmerring's enumeration; *portio dura* of the *seventh cranial nerve* in that of Willis.
[5] *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; also known as the *lingual motor nerve.*
[6] By Macalister called the *superficialis colli nerve.* [7] See Appendix, note 460.

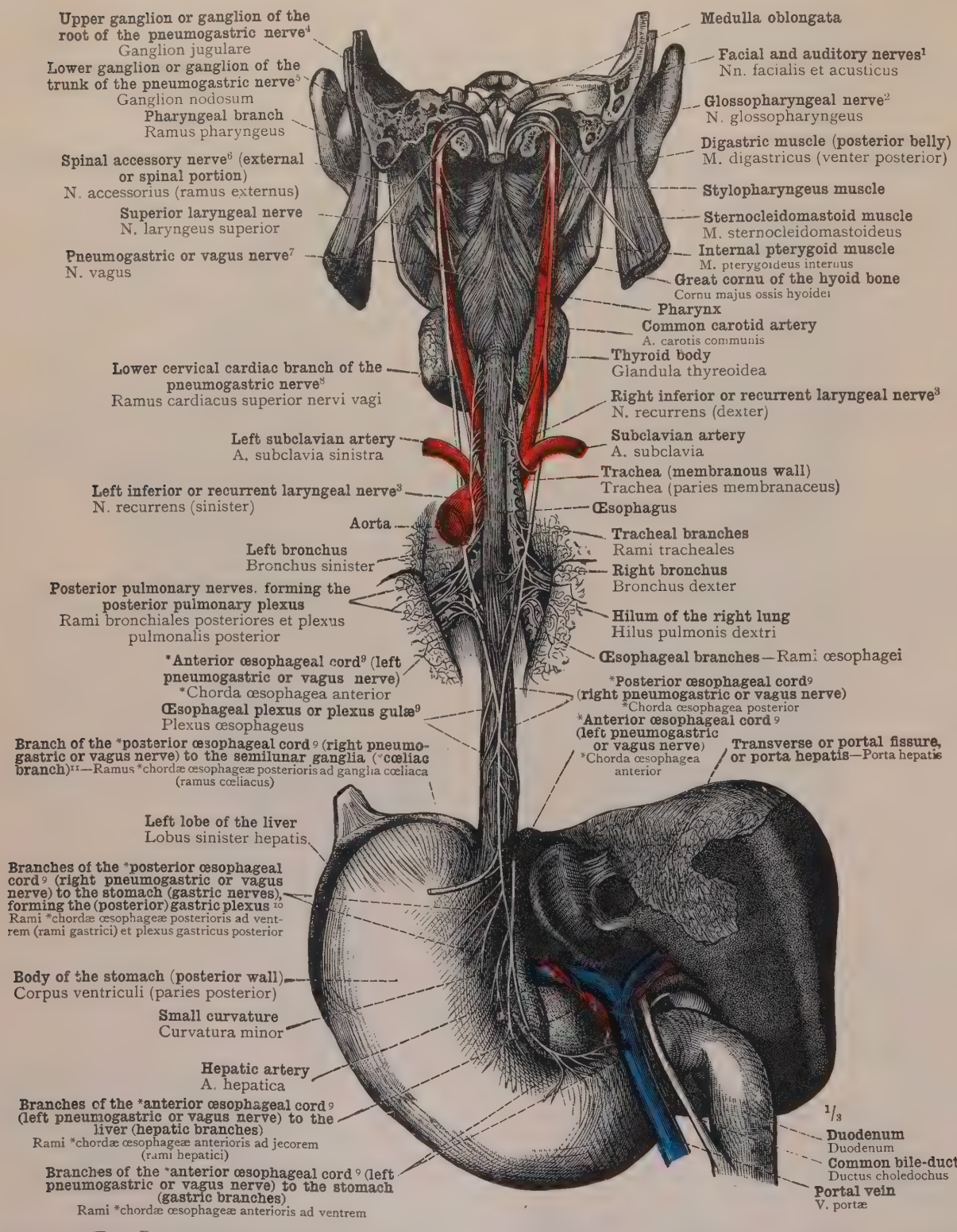

Upper ganglion or ganglion of the root of the pneumogastric nerve[4]
Ganglion jugulare
Lower ganglion or ganglion of the trunk of the pneumogastric nerve[5]
Ganglion nodosum
Pharyngeal branch
Ramus pharyngeus
Spinal accessory nerve[6] (external or spinal portion)
N. accessorius (ramus externus)
Superior laryngeal nerve
N. laryngeus superior
Pneumogastric or vagus nerve[7]
N. vagus
Medulla oblongata
Facial and auditory nerves[1]
Nn. facialis et acusticus
Glossopharyngeal nerve[2]
N. glossopharyngeus
Digastric muscle (posterior belly)
M. digastricus (venter posterior)
Stylopharyngeus muscle
Sternocleidomastoid muscle
M. sternocleidomastoideus
Internal pterygoid muscle
M. pterygoideus internus
Great cornu of the hyoid bone
Cornu majus ossis hyoidei
Pharynx
Common carotid artery
A. carotis communis
Thyroid body
Glandula thyreoidea
Lower cervical cardiac branch of the pneumogastric nerve[8]
Ramus cardiacus superior nervi vagi
Right inferior or recurrent laryngeal nerve[3]
N. recurrens (dexter)
Left subclavian artery
A. subclavia sinistra
Subclavian artery
A. subclavia
Trachea (membranous wall)
Trachea (paries membranaceus)
Left inferior or recurrent laryngeal nerve[3]
N. recurrens (sinister)
Œsophagus
Aorta
Tracheal branches
Rami tracheales
Left bronchus
Bronchus sinister
Right bronchus
Bronchus dexter
Posterior pulmonary nerves, forming the posterior pulmonary plexus
Rami bronchiales posteriores et plexus pulmonalis posterior
Hilum of the right lung
Hilus pulmonis dextri
Œsophageal branches—Rami œsophagei
*Anterior œsophageal cord[9] (left pneumogastric or vagus nerve)
*Chorda œsophagea anterior
*Posterior œsophageal cord[9] (right pneumogastric or vagus nerve)
*Chorda œsophagea posterior
Œsophageal plexus or plexus gulæ[9]
Plexus œsophageus
*Anterior œsophageal cord[9] (left pneumogastric or vagus nerve)
*Chorda œsophagea anterior
Transverse or portal fissure, or porta hepatis—Porta hepatis
Branch of the *posterior œsophageal cord[9] (right pneumogastric or vagus nerve) to the semilunar ganglia (*cœliac branch)[11]—Ramus *chordæ œsophageæ posterioris ad ganglia cœliaca (ramus cœliacus)
Left lobe of the liver
Lobus sinister hepatis
Branches of the *posterior œsophageal cord[9] (right pneumogastric or vagus nerve) to the stomach (gastric nerves), forming the (posterior) gastric plexus[10]
Rami *chordæ œsophageæ posterioris ad ventrem (rami gastrici) et plexus gastricus posterior
Body of the stomach (posterior wall)
Corpus ventriculi (paries posterior)
Small curvature
Curvatura minor
Hepatic artery
A. hepatica
Branches of the *anterior œsophageal cord[9] (left pneumogastric or vagus nerve) to the liver (hepatic branches)
Rami *chordæ œsophageæ anterioris ad jecorem (rami hepatici)
Branches of the *anterior œsophageal cord[9] (left pneumogastric or vagus nerve) to the stomach (gastric branches)
Rami *chordæ œsophageæ anterioris ad ventrem
1/3
Duodenum
Duodenum
Common bile-duct
Ductus choledochus
Portal vein
V. portæ

FIG. 1315.—THE PNEUMOGASTRIC OR VAGUS NERVE, N. VAGUS; VIEW OF ITS PRINCIPAL BRANCHES, AS SEEN FROM BEHIND IN RELATION TO THE VISCERA, WHICH HAVE BEEN REMOVED FROM THE BODY.

The course and distribution of the auricular branch of the pneumogastric nerve, or nerve of Arnold, ramus auricularis nervi vagi, are shown in Fig. 1310, p. 868.

[1] In Soemmerring's enumeration the *facial* is the *seventh*, the *auditory* is the *eighth cranial nerve*; in that of Willis the former is the *portio dura*, the latter the *portio mollis*, of the *seventh cranial nerve*.
[2] *Ninth cranial nerve* in Soemmerring's enumeration; *first trunk* of the *eighth cranial nerve* in that of Willis.
[3] See Appendix, note 462. [4] See Appendix, note 463.
[5] Sometimes called the *cervical ganglion* of the vagus nerve. Macalister uses the Latin equivalent, *ganglion cervicale vagi*.
[6] *Eleventh cranial nerve* in Soemmerring's enumeration; *third trunk* of the *eighth cranial nerve* in that of Willis.
[7] *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.
[8] See Appendix, note 422. [9] See Appendix, note 464. [10] See Appendix, note 465. [11] See Appendix, note 466.

Vagus Group.

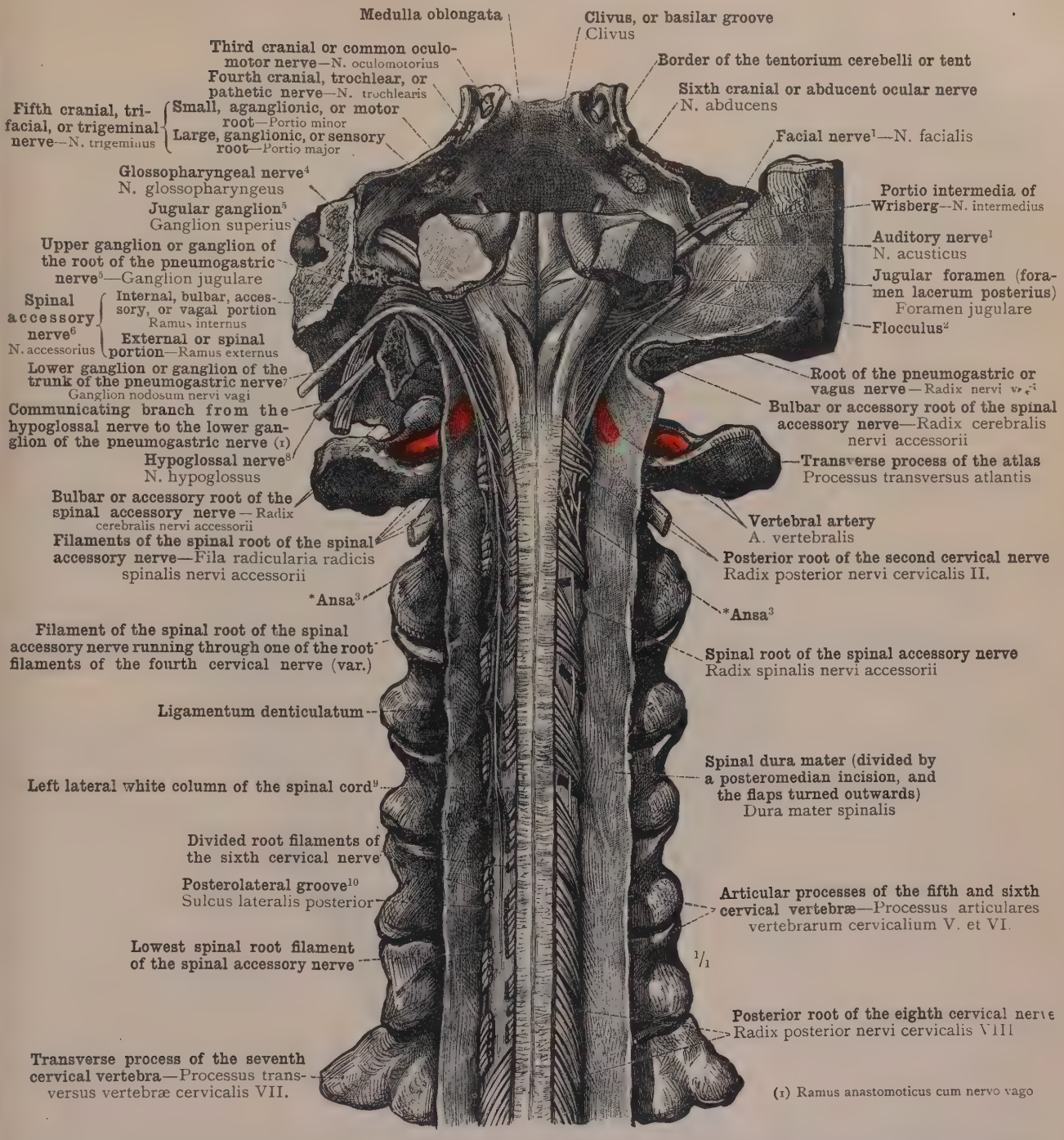
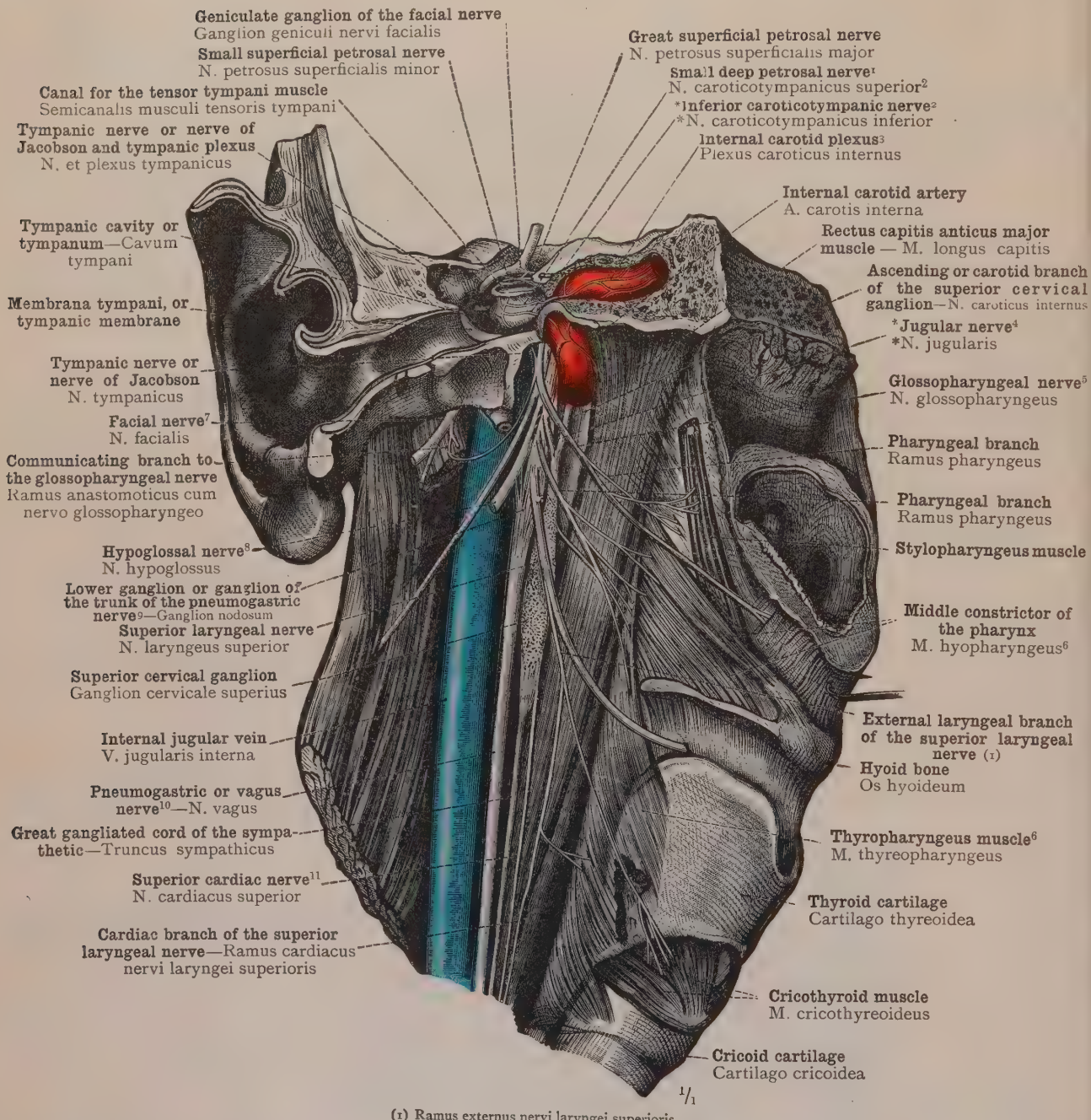

Medulla oblongata
Clivus, or basilar groove
Clivus
Third cranial or common oculomotor nerve—N. oculomotorius
Fourth cranial, trochlear, or pathetic nerve—N. trochlearis
Border of the tentorium cerebelli or tent
Sixth cranial or abducent ocular nerve
N. abducens
Fifth cranial, trifacial, or trigeminal nerve—N. trigeminus
Small, aganglionic, or motor root—Portio minor
Large, ganglionic, or sensory root—Portio major
Facial nerve[1]—N. facialis
Glossopharyngeal nerve[4]
N. glossopharyngeus
Jugular ganglion[5]
Ganglion superius
Portio intermedia of Wrisberg—N. intermedius
Auditory nerve[1]
N. acusticus
Upper ganglion or ganglion of the root of the pneumogastric nerve[5]—Ganglion jugulare
Jugular foramen (foramen lacerum posterius)
Foramen jugulare
Spinal accessory nerve[6]
N. accessorius
Internal, bulbar, accessory, or vagal portion
Ramus internus
External or spinal portion—Ramus externus
Flocculus[2]
Lower ganglion or ganglion of the trunk of the pneumogastric nerve[7]
Ganglion nodosum nervi vagi
Root of the pneumogastric or vagus nerve—Radix nervi vagi
Communicating branch from the hypoglossal nerve to the lower ganglion of the pneumogastric nerve (1)
Bulbar or accessory root of the spinal accessory nerve—Radix cerebralis nervi accessorii
Hypoglossal nerve[8]
N. hypoglossus
Transverse process of the atlas
Processus transversus atlantis
Bulbar or accessory root of the spinal accessory nerve—Radix cerebralis nervi accessorii
Vertebral artery
A. vertebralis
Filaments of the spinal root of the spinal accessory nerve—Fila radicularia radicis spinalis nervi accessorii
Posterior root of the second cervical nerve
Radix posterior nervi cervicalis II.
*Ansa[3]
*Ansa[3]
Filament of the spinal root of the spinal accessory nerve running through one of the root filaments of the fourth cervical nerve (var.)
Spinal root of the spinal accessory nerve
Radix spinalis nervi accessorii
Ligamentum denticulatum
Spinal dura mater (divided by a posteromedian incision, and the flaps turned outwards)
Dura mater spinalis
Left lateral white column of the spinal cord[9]
Divided root filaments of the sixth cervical nerve
Posterolateral groove[10]
Sulcus lateralis posterior
Articular processes of the fifth and sixth cervical vertebræ—Processus articulares vertebrarum cervicalium V. et VI.
Lowest spinal root filament of the spinal accessory nerve
1/1
Posterior root of the eighth cervical nerve
Radix posterior nervi cervicalis VIII
Transverse process of the seventh cervical vertebra—Processus transversus vertebræ cervicalis VII.
(1) Ramus anastomoticus cum nervo vago

FIG. 1316.—THE ROOTS OF THE PNEUMOGASTRIC OR VAGUS NERVE, N. VAGUS (*see note* [11] *below*), AND THE SPINAL ACCESSORY NERVE, N. ACCESSORIUS (*see note* [6] *below*); THE DIVISION OF THE SPINAL ACCESSORY NERVE INTO AN INTERNAL, BULBAR, ACCESSORY, OR VAGAL PORTION, RAMUS INTERNUS, AND AN EXTERNAL OR SPINAL PORTION, RAMUS EXTERNUS. SEEN FROM BEHIND.

After removing the tabular portion of the occipital bone and the arches of the vertebræ, a posteromedian incision was made through the spinal dura mater and the flaps were turned outwards, the arachnoid was removed, and on the left side those portions of the posterior roots of the spinal nerves which cover the spinal root filaments of the spinal accessory nerve were cut out; on the right side strips of black paper were passed beneath the spinal root of this nerve. On the left side the nerves emerging through the jugular foramen (foramen jugulare, foramen lacerum posterius) were exposed.

1 In Soemmerring's enumeration the *facial* is the *seventh*, the *auditory* the *eighth cranial nerve*; in that of Willis the former is the *portio dura*, the latter the *portio mollis*, of the *seventh cranial nerve*.
2 Or *subpeduncular lobe* (Ellis). 3 See Appendix, note 415.
4 *Ninth cranial nerve* in Soemmerring's enumeration; *first trunk* of the *eighth cranial nerve* in that of Willis.
5 See Appendix, note 467.
6 *Eleventh cranial nerve* in Soemmerring's enumeration; *third trunk* of the *eighth cranial nerve* in that of Willis.
7 See note 5 to p. 872.
8 *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; known also as the *lingual motor nerve*.
9 See Appendix, note 330. 10 See Appendix, note 335.
11 *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.

Vagus Group.

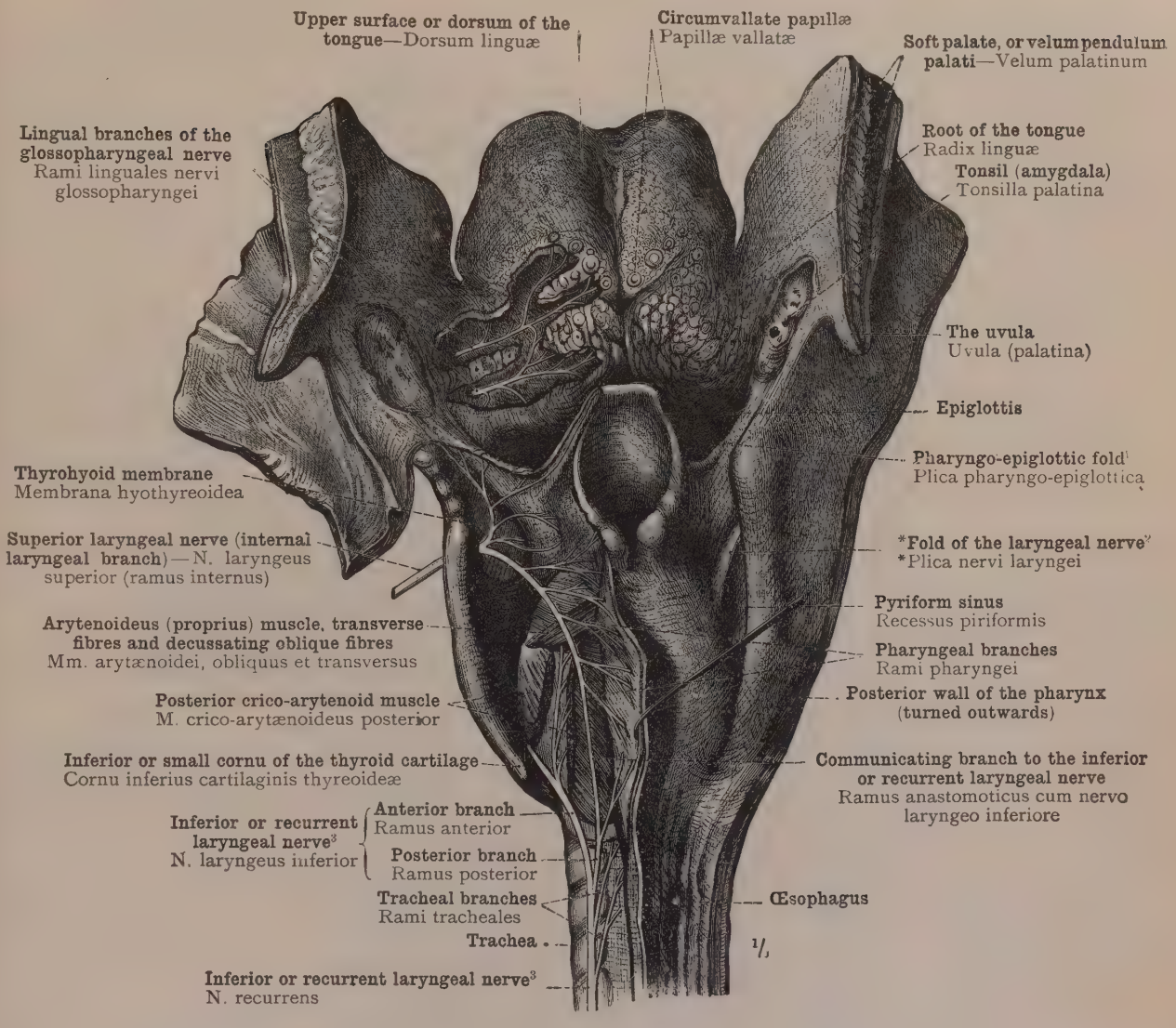


(1) Ramus externus nervi laryngei superioris

FIG. 1317.—THE GLOSSOPHARYNGEAL NERVE, N. GLOSSOPHARYNGEUS (*see note 6 below*); ITS COMMUNICATING BRANCH TO THE FACIAL NERVE, N. FACIALIS (*see note 7 below*); THE TYMPANIC NERVE (N. TYMPANICUS), TYMPANIC PLEXUS (PLEXUS TYMPANICUS), SMALL DEEP PETROSAL NERVE (N. CAROTICOTYMPANICUS SUPERIOR — *see Appendix, note* 452), *INFERIOR CAROTICOTYMPANIC NERVE (N. CAROTICOTYMPANICUS INFERIOR — *see Appendix, note* 468); THE BRANCHES OF THE GLOSSOPHARYNGEAL NERVE TO THE PHARYNX AND TO THE STYLOPHARYNGEUS MUSCLE. THE COMMUNICATION OF THE PNEUMOGASTRIC OR VAGUS NERVE, N. VAGUS (*see note 10 below*), WITH THE HYPOGLOSSAL NERVE, N. HYPOGLOSSUS (*see note 8 below*), AND WITH THE SYMPATHETIC NERVOUS SYSTEM, AND THE PHARYNGEAL AND LARYNGEAL BRANCHES OF THE PNEUMOGASTRIC NERVE.

On the right side of the head a saw-cut was made through the external auditory meatus, the tympanum, and the anterior wall of the carotid canal, and the basilar portion or process of the occipital bone was divided transversely. The pharynx and the soft palate were detached from the base of the skull; and the pharynx with the stylopharyngeus muscle and the larynx was drawn to the left.

1 See Appendix, note 452. 2 See Appendix, note 468. 3 See note 3 to p. 859. 4 See Appendix, note 469.
5 *Ninth cranial nerve* in Soemmerring's enumeration; *first trunk* of the *eighth cranial nerve* in that of Willis.
6 See Appendix, note 470.
7 *Seventh cranial nerve* in Soemmerring's enumeration; *portio dura* of the *seventh* in that of Willis.
8 *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; also known as the *lineual motor nerve.*
9 See note 5 to p. 872.
10 *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.
11 Also called the *superficial cardiac nerve.*



[1] See note 7 to p. 415, in Part IV. [2] See note 3 to p. 434, in Part IV. [3] See Appendix, note 462.

FIG. 1318.—THE PERIPHERAL OFFSETS OF THE GLOSSOPHARYNGEAL NERVE, N. GLOSSOPHARYNGEUS, TO THE MUCOUS MEMBRANE OF THE ROOT OF THE TONGUE AND TO THE CIRCUMVALLATE PAPILLÆ. (THE BRANCHES OF THIS NERVE TO THE EDGE OF THE TONGUE ARE SHOWN IN FIG. 1324, p. 381.) THE OFFSETS OF THE INTERNAL LARYNGEAL BRANCH OF THE SUPERIOR LARYNGEAL NERVE, RAMUS INTERNUS NERVI LARYNGEI SUPERIORIS, TO THE MUCOUS MEMBRANE OF THE LARYNX AND THE PHARYNX, AND THE COMMUNICATING BRANCH TO THE INFERIOR OR RECURRENT LARYNGEAL NERVE, N. LARYNGEUS INFERIOR (*see Appendix, note* 462). SEEN FROM BEHIND.

The tongue, the soft palate, and the pharynx having been excised, the soft palate was divided by a median incision and its halves turned right and left. The branches of the glossopharyngeal nerve were exposed by the partial removal of the mucous membrane of the root of the tongue. In order to display the ramification of the superior laryngeal nerve, the mucous membrane of the pharynx was raised and turned inwards on the left side from the pharyngo-epiglottic fold above to the junction of the pharynx with the œsophagus below

Vagus Group.

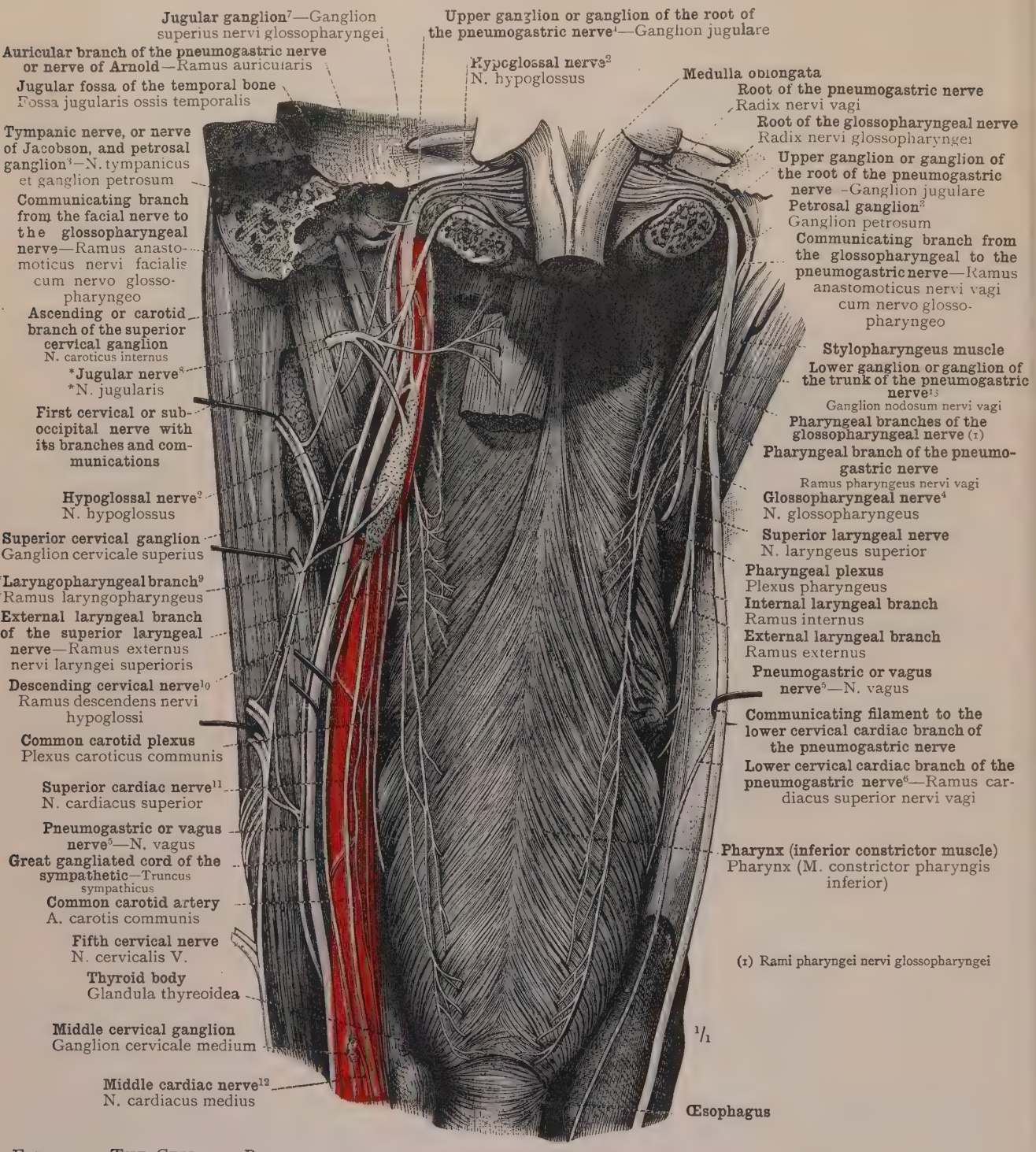

Jugular ganglion[7]—Ganglion superius nervi glossopharyngei
Upper ganglion or ganglion of the root of the pneumogastric nerve[4]—Ganglion jugulare
Auricular branch of the pneumogastric nerve or nerve of Arnold—Ramus auricularis
Hypoglossal nerve[2] N. hypoglossus
Medulla oblongata
Jugular fossa of the temporal bone Fossa jugularis ossis temporalis
Root of the pneumogastric nerve Radix nervi vagi
Root of the glossopharyngeal nerve Radix nervi glossopharyngei
Tympanic nerve, or nerve of Jacobson, and petrosal ganglion[3]—N. tympanicus et ganglion petrosum
Upper ganglion or ganglion of the root of the pneumogastric nerve—Ganglion jugulare
Petrosal ganglion[3] Ganglion petrosum
Communicating branch from the facial nerve to the glossopharyngeal nerve—Ramus anastomoticus nervi facialis cum nervo glossopharyngeo
Communicating branch from the glossopharyngeal to the pneumogastric nerve—Ramus anastomoticus nervi vagi cum nervo glossopharyngeo
Ascending or carotid branch of the superior cervical ganglion N. caroticus internus
Stylopharyngeus muscle
*Jugular nerve[8] *N. jugularis
Lower ganglion or ganglion of the trunk of the pneumogastric nerve[13] Ganglion nodosum nervi vagi
First cervical or suboccipital nerve with its branches and communications
Pharyngeal branches of the glossopharyngeal nerve (1)
Pharyngeal branch of the pneumogastric nerve Ramus pharyngeus nervi vagi
Hypoglossal nerve[2] N. hypoglossus
Glossopharyngeal nerve[4] N. glossopharyngeus
Superior cervical ganglion Ganglion cervicale superius
Superior laryngeal nerve N. laryngeus superior
*Laryngopharyngeal branch[9] *Ramus laryngopharyngeus
Pharyngeal plexus Plexus pharyngeus
External laryngeal branch of the superior laryngeal nerve—Ramus externus nervi laryngei superioris
Internal laryngeal branch Ramus internus
External laryngeal branch Ramus externus
Descending cervical nerve[10] Ramus descendens nervi hypoglossi
Pneumogastric or vagus nerve[5]—N. vagus
Communicating filament to the lower cervical cardiac branch of the pneumogastric nerve
Common carotid plexus Plexus caroticus communis
Lower cervical cardiac branch of the pneumogastric nerve[6]—Ramus cardiacus superior nervi vagi
Superior cardiac nerve[11] N. cardiacus superior
Pneumogastric or vagus nerve[5]—N. vagus
Pharynx (inferior constrictor muscle) Pharynx (M. constrictor pharyngis inferior)
Great gangliated cord of the sympathetic—Truncus sympathicus
Common carotid artery A. carotis communis
(1) Rami pharyngei nervi glossopharyngei
Fifth cervical nerve N. cervicalis V.
Thyroid body Glandula thyreoidea
Middle cervical ganglion Ganglion cervicale medium
1/1
Middle cardiac nerve[12] N. cardiacus medius
Œsophagus

FIG. 1319.—THE CEPHALIC PORTION AND THE UPPER PART OF THE CERVICAL PORTION OF THE PNEUMOGASTRIC OR VAGUS NERVE, N. VAGUS, SEEN FROM BEHIND. ON THE LEFT SIDE THE COMMUNICATIONS OF THE PNEUMOGASTRIC NERVE WITH THE GLOSSOPHARYNGEAL NERVE, N. GLOSSOPHARYNGEUS, AND THE HYPOGLOSSAL NERVE, N. HYPOGLOSSUS, AS WELL AS THE COMMUNICATIONS OF THE SYMPATHETIC NERVOUS SYSTEM WITH THE NERVES JUST NAMED AND WITH THE UPPER CERVICAL NERVES, ARE DISPLAYED; ON THIS SIDE ALSO THE UPPER EXTREMITIES OF THE RECTUS CAPITIS ANTICUS MUSCLES, MAJOR AND MINOR, HAVE BEEN PRESERVED. ON THE RIGHT SIDE THE PNEUMOGASTRIC AND GLOSSOPHARYNGEAL NERVES ONLY, WITH THEIR PHARYNGEAL BRANCHES, RAMI PHARYNGEI, AND THE PHARYNGEAL PLEXUS, PLEXUS PHARYNGEUS, ARE DISPLAYED.

[1] See Appendix, note 447.
[2] *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; also known as the *lingual motor nerve.*
[3] Known also as *Andersch's ganglion.*
[4] *Ninth cranial nerve* in Soemmerring's enumeration; *first trunk* of the *eighth cranial nerve* in that of Willis.
[5] *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.
[6] See Appendix, note 422.
[7] See Appendix, note 467.
[8] See Appendix, note 469.
[9] This name is used neither by Quain nor by Macalister.
[10] See Appendix, note 420.
[11] Also called the *superficial cardiac nerve.*
[12] Also called the *great* or *deep cardiac nerve.*
[13] See note [5] to p. 872.

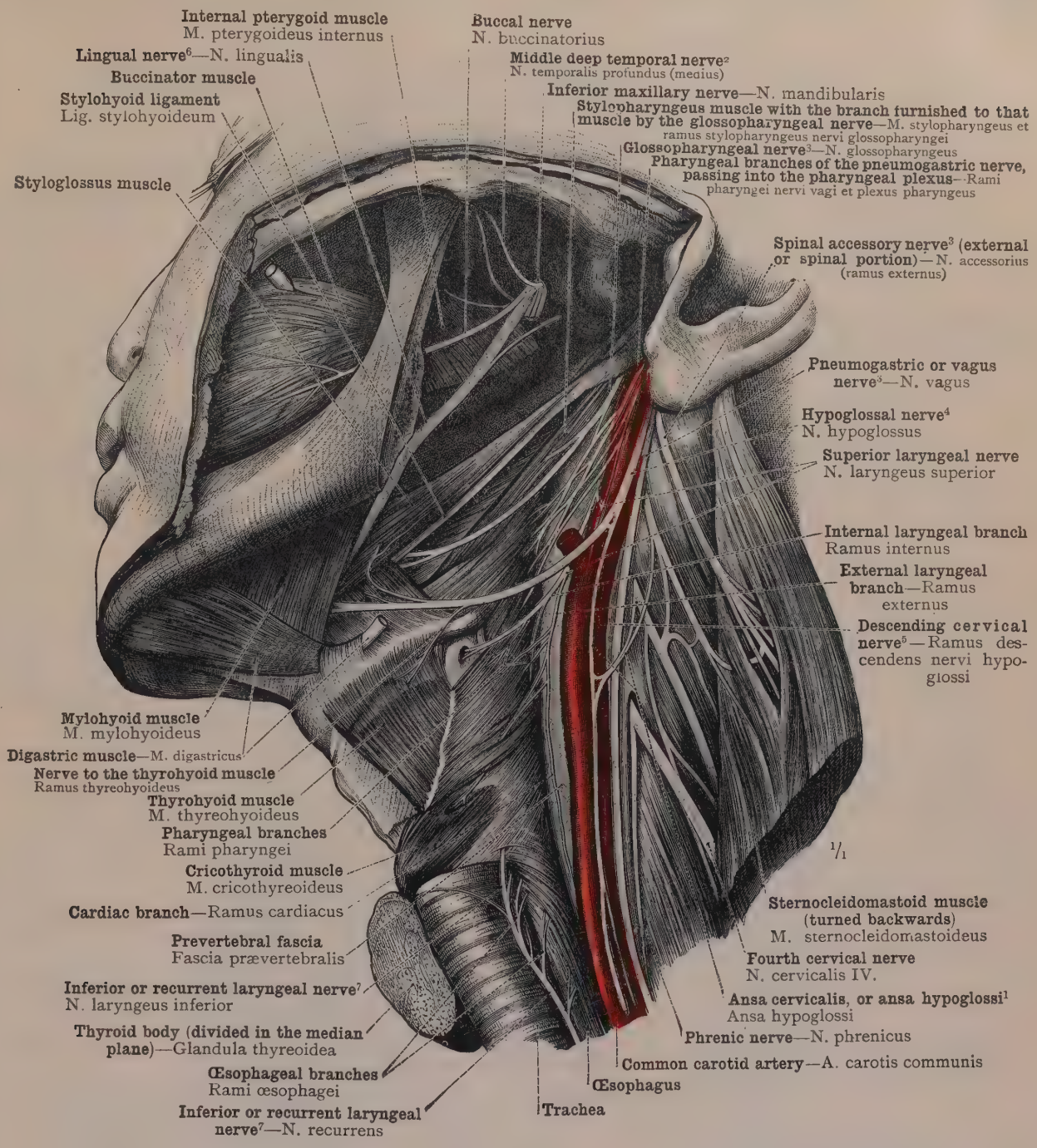


FIG. 1320.—THE HYPOGLOSSAL NERVE, N. HYPOGLOSSUS (*see note* [4] *below*), DISPLAYED ON THE LEFT SIDE OF THE NECK; ITS DESCENDING BRANCH. THE DESCENDING CERVICAL NERVE, RAMUS DESCENDENS NERVI HYPOGLOSSI (*see Appendix, note* [420]), WITH THE ANSA CERVICALIS OR ANSA HYPOGLOSSI (*see note* [1] *below*). WITH REGARD TO THE DISTRIBUTION OF THE DESCENDING CERVICAL NERVE, *see Fig.* 1249, *p.* 817; AND WITH REGARD TO THE TERMINAL EXPANSION OF THE HYPOGLOSSAL NERVE IN THE TONGUE, *see Fig.* 1325, *p.* 882. THE MUTUAL RELATIONS OF THE GLOSSOPHARYNGEAL NERVE, N. GLOSSOPHARYNGEUS, AND THE PNEUMOGASTRIC OR VAGUS NERVE, N. VAGUS (*see note* [3] *below*); THE PHARYNGEAL BRANCHES, RAMI PHARYNGEI, OF THESE NERVES, FORMING THE PHARYNGEAL PLEXUS, PLEXUS PHARYNGEUS. THE EXTERNAL OR SPINAL PORTION, RAMUS EXTERNUS, OF THE SPINAL ACCESSORY NERVE, N. ACCESSORIUS (*see note* [3] *below*), AND ITS COMMUNICATION WITH THE SECOND AND THIRD CERVICAL NERVES. A PART OF THE RAMIFICATION OF THE INFERIOR MAXILLARY NERVE, N. MANDIBULARIS.

The posterior belly of the digastric muscle and the stylohyoid muscle have been removed, and the sternocleidomastoid muscle has been turned backwards.

1 Also called *ansa infrahyoidea.* See Appendix, note [421].

2 In Fig. 1305, p. 865, the author shows *anterior* and *posterior deep temporal nerves* only, and these are the only *deep* temporal nerves mentioned in Von Langer and Toldt's "Anatomy" (see Appendix, note [454]). In this figure, however, a *middle deep temporal nerve* also is shown.

3 In Soemmerring's enumeration the *glossopharyngeal* is the *ninth cranial nerve*, the *pneumogastric* the *tenth*, and the *spinal accessory* the *eleventh*; in that of Willis they are respectively the *first*, *second*, and *third trunks* of the *eighth cranial nerve.*

4 *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; also known as the *lingual motor nerve.*

5 See Appendix, note [420]. 6 Formerly known also as the *gustatory nerve.* 7 See Appendix, note [452].

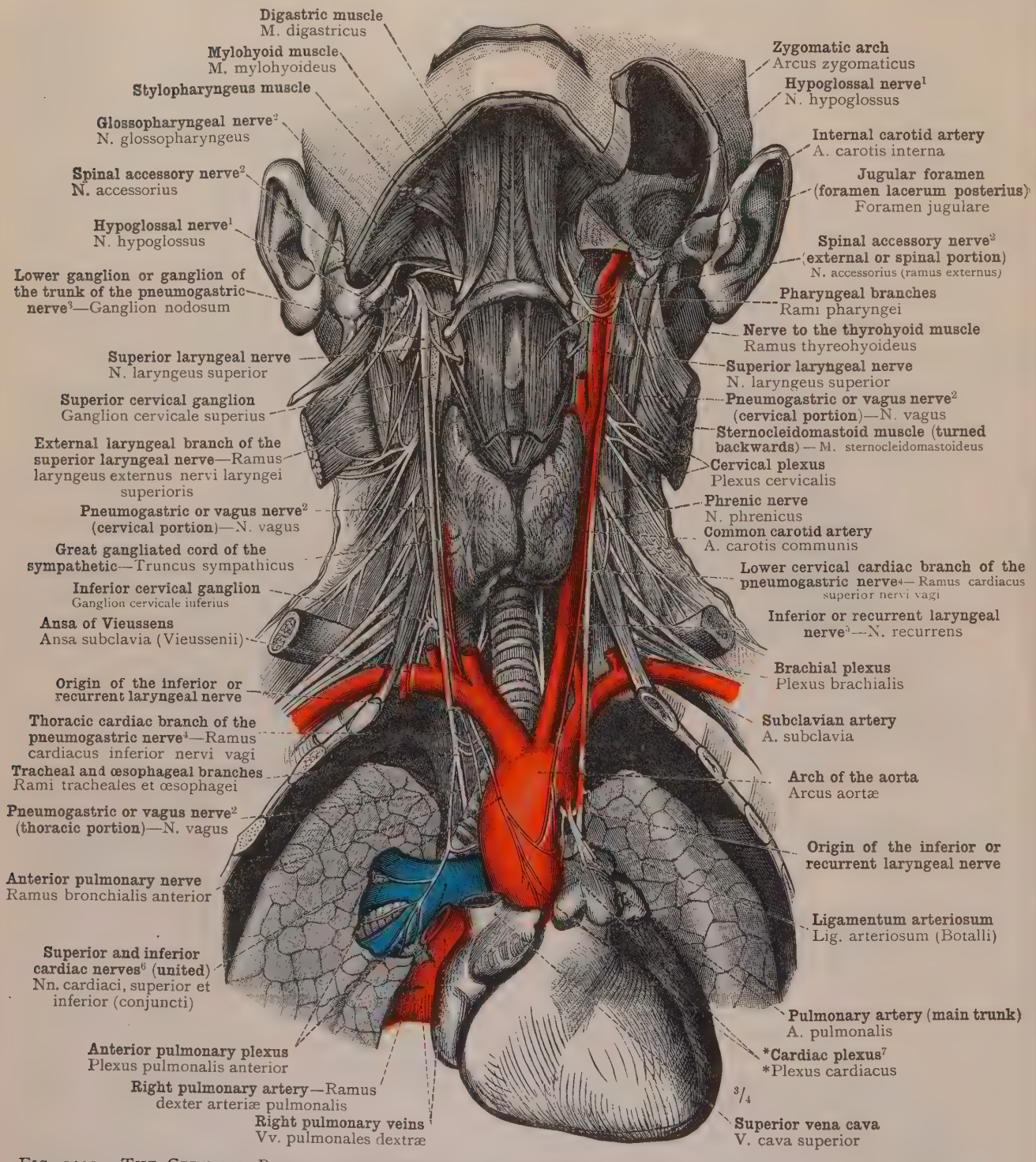
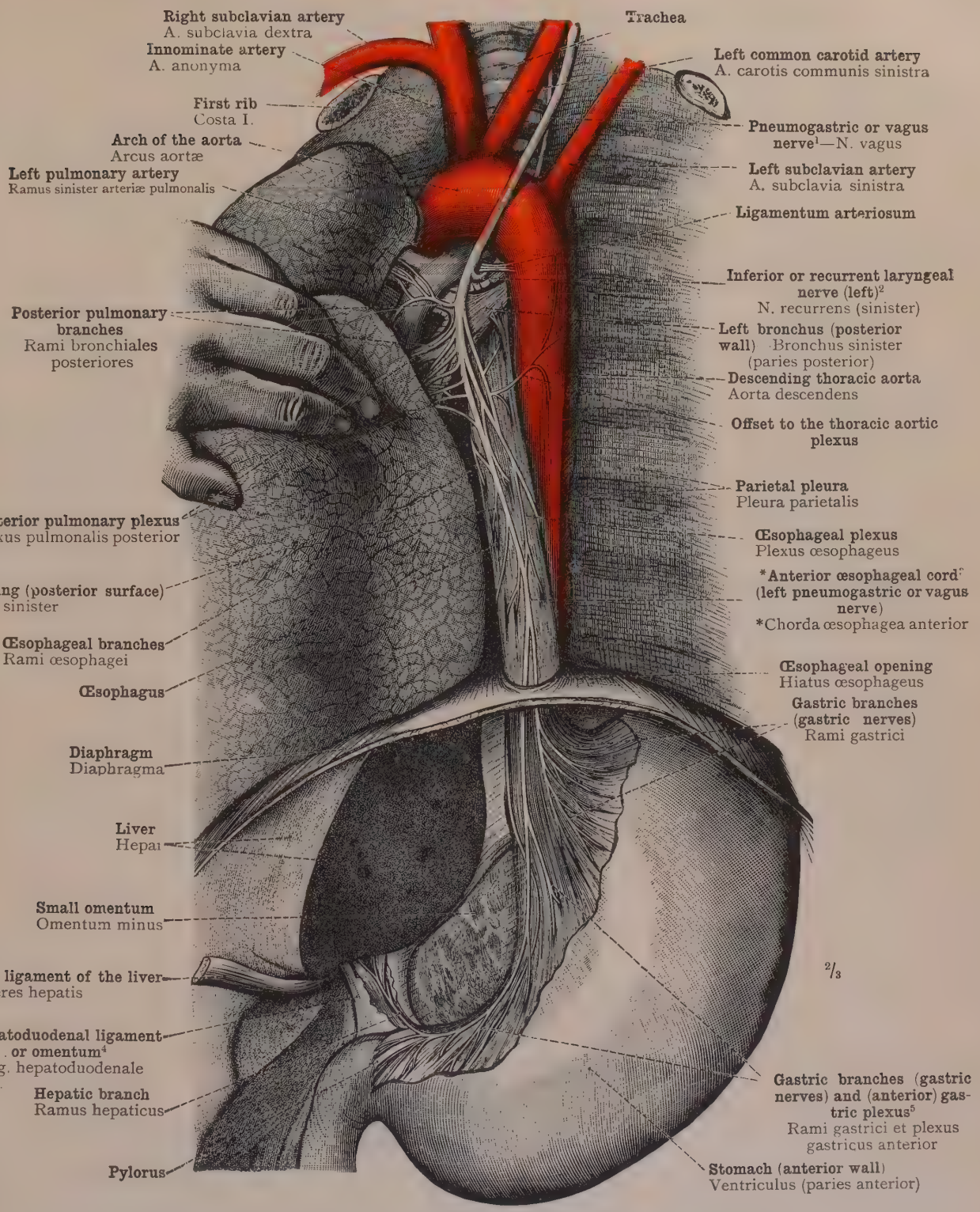


FIG. 1321.—THE CERVICAL PORTION AND THE UPPERMOST PART OF THE THORACIC PORTION OF THE PNEUMOGASTRIC OR VAGUS NERVE, N. VAGUS (*see note* [2] *below*), SEEN FROM BEFORE; THE CARDIAC BRANCHES, RAMI CARDIACI, AND THE ANTERIOR PULMONARY BRANCH, RAMUS BRONCHIALIS ANTERIOR, OF THIS NERVE. THE ORIGIN OF THE INFERIOR OR RECURRENT LARYNGEAL NERVE, N. RECURRENS (*see Appendix, note* [462]) FROM THE PNEUMOGASTRIC TRUNK. ON THE RIGHT SIDE OF THE BODY THE GREAT GANGLIATED CORD OF THE SYMPATHETIC IS ALSO DISPLAYED.

The head is bent strongly backwards.

[1] *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; also known as the *lingual motor nerve*.
[2] In Soemmerring's enumeration the *glossopharyngeal nerve* is the *ninth cranial nerve*, the *pneumogastric* the *tenth*, and the *spinal accessory* the *eleventh*; in that of Willis they are respectively the *first*, *second*, and *third trunks* of the *eighth cranial nerve*.
[3] See note [5] to p. 872. [4] See Appendix, note [422]. [5] See Appendix, note [462].
[6] The *superior cardiac nerve* is known also as the *superficial cardiac*, and the *middle cardiac* as the *deep* or *great cardiac nerve*.
[7] See Appendix, note [471].



[1] *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.
[2] See Appendix, note 462. [3] See Appendix, note 464. [4] See Appendix to Part IV., note 42.

FIG. 1322.—THE THORACIC PORTION OF THE LEFT PNEUMOGASTRIC OR VAGUS NERVE, N. VAGUS (*see note* [1] *above*), SEEN FROM BEFORE. THE POSTERIOR PULMONARY BRANCHES, RAMI BRONCHIALES POSTERIORES, THE ŒSOPHAGEAL PLEXUS, PLEXUS ŒSOPHAGEUS, AND THE RAMIFICATION OF THE *ANTERIOR ŒSOPHAGEAL CORD (LEFT PNEUMOGASTRIC OR VAGUS NERVE), *CHORDA ŒSOPHAGEA ANTERIOR (*see Appendix, note* 464), ON THE ANTERIOR WALL OF THE STOMACH. (COMPARE WITH THIS FIGURE FIG. 1315, p. 872.)

The left lung has been drawn out of the thoracic cavity and turned to the right.

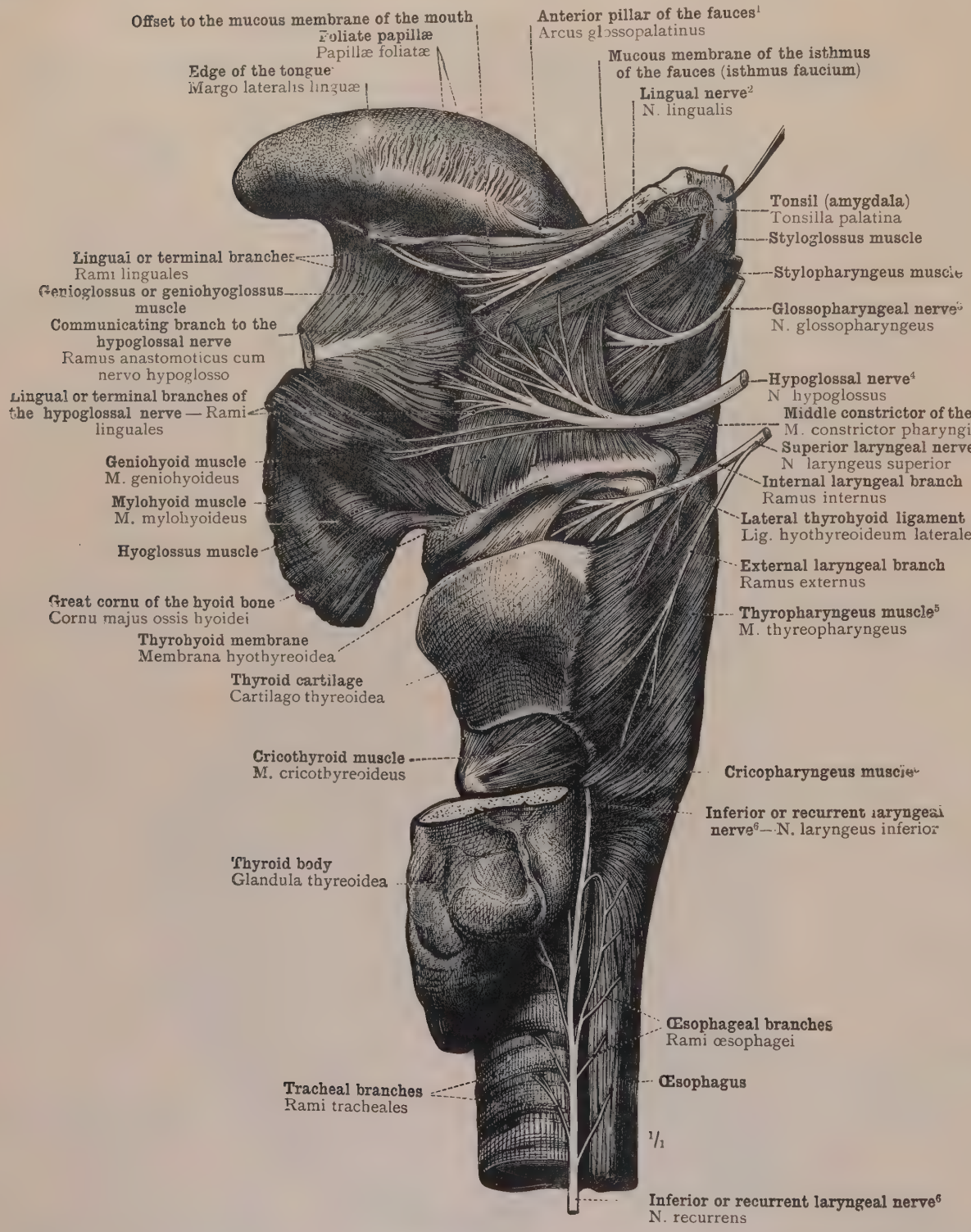


FIG. 1223.—THE DISTRIBUTION OF THE LINGUAL NERVE, N. LINGUALIS (*see note* [2] *below*), THE GLOSSOPHARYNGEAL NERVE, N. GLOSSOPHARYNGEUS (*see note* [3] *below*), AND THE HYPOGLOSSAL NERVE, N. HYPOGLOSSUS (*see note* [4] *below*), ALSO OF THE SUPERIOR LARYNGEAL NERVE, N. LARYNGEUS SUPERIOR, AND THE INFERIOR OR RECURRENT LARYNGEAL NERVE, N. RECURRENS (*see Appendix, note* [462]), AS SEEN FROM THE LEFT SIDE ON THE OUTER SURFACE OF THE ISOLATED CEPHALIC AND CERVICAL VISCERA.

In order to lay bare the cricothyroid muscle, musculus cricothyreoideus, and the nerve to the cricothyroid muscle, the upper half of the left lateral lobe of the thyroid body was cut away.

[1] Known also as the *anterior palatine*, or *glossopalatine, arch.* [2] Formerly known also as the *gustatory nerve.*
[3] *Ninth cranial nerve* in Soemmerring's enumeration; *first trunk* of the *eighth cranial nerve* in that of Willis.
[4] *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; also known as the *lingual motor nerve.*
[5] The *thyropharyngeus muscle* is the *upper* part, the *cricopharyngeus muscle* the *lower* part, of the *inferior constrictor of the pharynx.* See Fig. 706, p. 433, in Part IV.
[6] See Appendix, note [462].

Vagus Group.

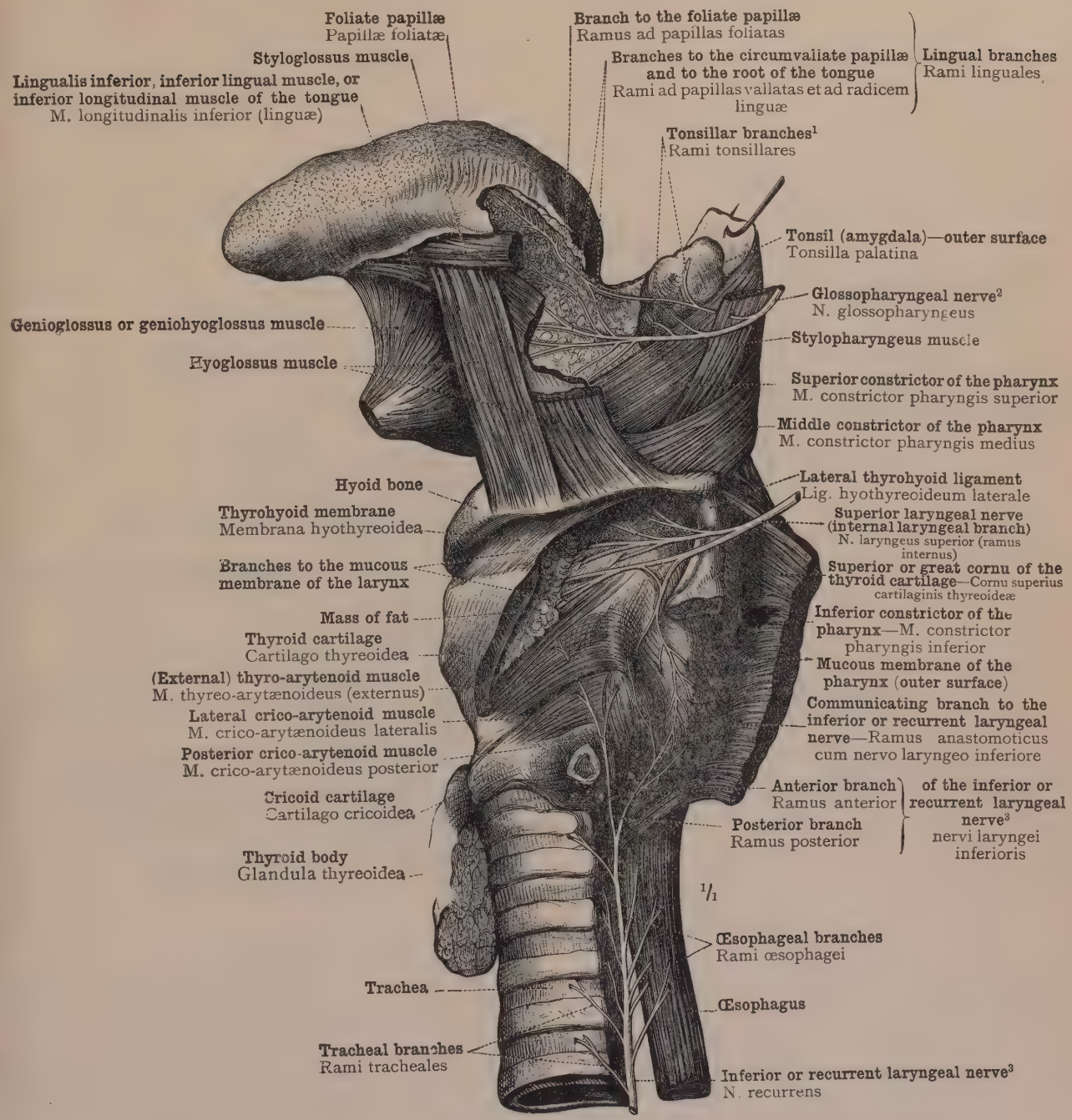
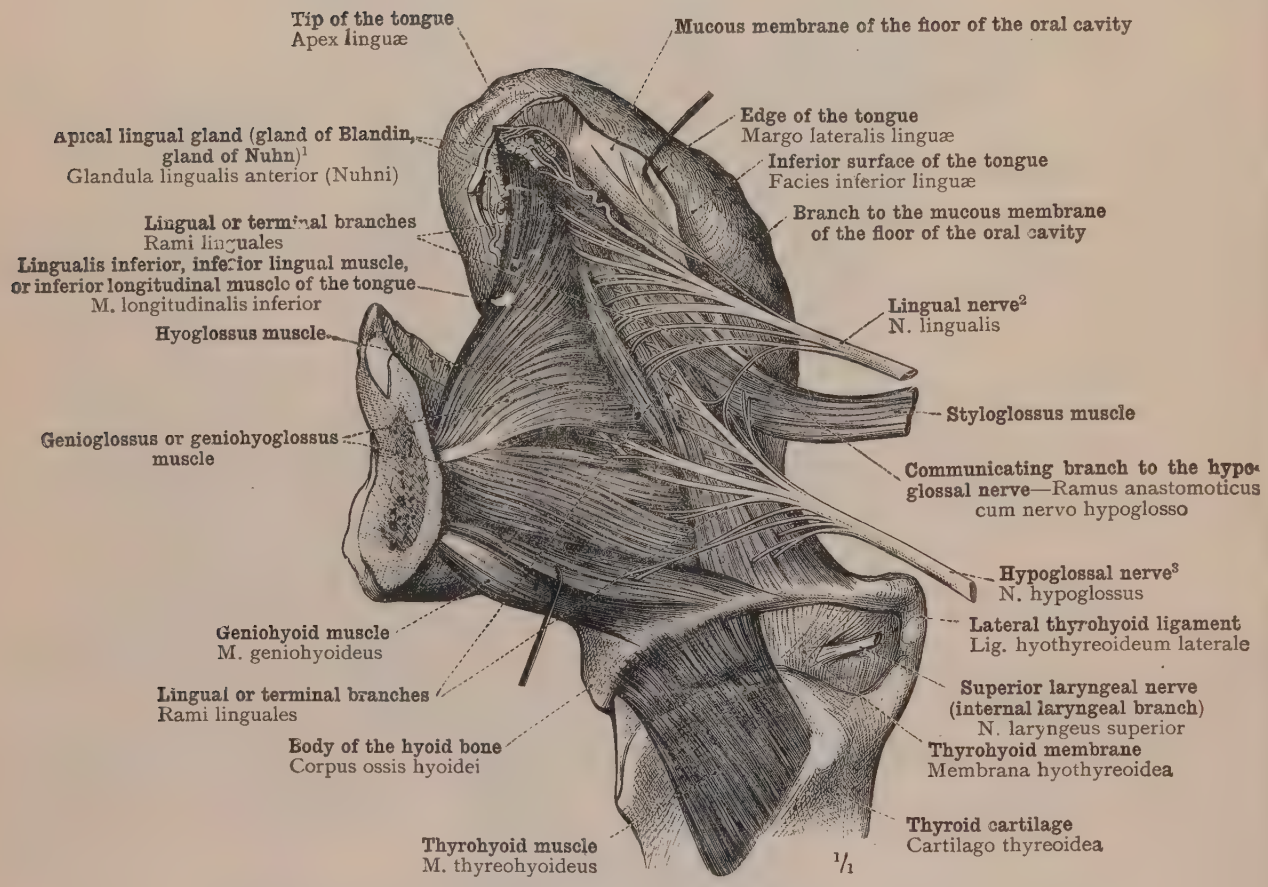


FIG. 1324.—THE TERMINAL RAMIFICATION OF THE GLOSSOPHARYNGEAL NERVE, N. GLOSSOPHARYNGEUS (*see note* [2] *below*) IN THE REGION OF THE ISTHMUS OF THE FAUCES, ISTHMUS FAUCIUM, ON THE OUTER SURFACE OF THE TONSIL (TONSILLA PALATINA), AND ON THE EDGE OF THE TONGUE, MARGO LATERALIS LINGUÆ. THE DISTRIBUTION OF THE SUPERIOR LARYNGEAL NERVE, N. LARYNGEUS SUPERIOR, AND THE INFERIOR OR RECURRENT LARYNGEAL NERVE, N LARYNGEUS INFERIOR (*see Appendix, note* [462]), TO THE LARYNX AND THE PHARYNX, DISPLAYED BY THE REMOVAL OF THE GREATER PART OF THE LEFT ALA OF THE THYROID CARTILAGE AND OF THE INFERIOR CONSTRICTOR OF THE PHARYNX, M. CONSTRICTOR PHARYNGIS INFERIOR. SEEN FROM THE LEFT SIDE. (FIGURE 1318 SHOULD BE COMPARED WITH THIS FIGURE.)

[1] Quain speaks of the *tonsillitic branches* of the glossopharyngeal nerve. The adjectival form *tonsillar*, which is used by the same author of the arteries of the tonsil, is to be preferred, and is used in the text.

[2] *Ninth cranial nerve* in Soemmerring's enumeration; *first trunk* of the *eighth cranial nerve* in that of Willis.

[3] See Appendix, note [462].



[1] See note [2] to p. 420, in Part IV. [2] Formerly known also as the *gustatory nerve.*
[3] *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; also known as the *lingual motor nerve.*

FIG. 1325.—THE RAMIFICATION OF THE HYPOGLOSSAL NERVE, N. HYPOGLOSSUS (*see note* [3] *above*), AND THE LINGUAL NERVE, N. LINGUALIS (*see note* [2] *above*), IN THE TONGUE, AND THE COMMUNICATIONS BETWEEN THESE TWO NERVES, SEEN OBLIQUELY FROM BELOW AND THE LEFT SIDE. THE ENTRANCE OF THE INTERNAL LARYNGEAL BRANCH OF THE SUPERIOR LARYNGEAL NERVE, RAMUS INTERNUS NERVI LARYNGEI SUPERIORIS, INTO THE INTERIOR OF THE LARYNX THROUGH THE THYROHYOID MEMBRANE, MEMBRANA HYOTHYREOIDEA.

SYSTEMA NERVORUM SYMPATHICUM

THE SYMPATHETIC NERVOUS SYSTEM

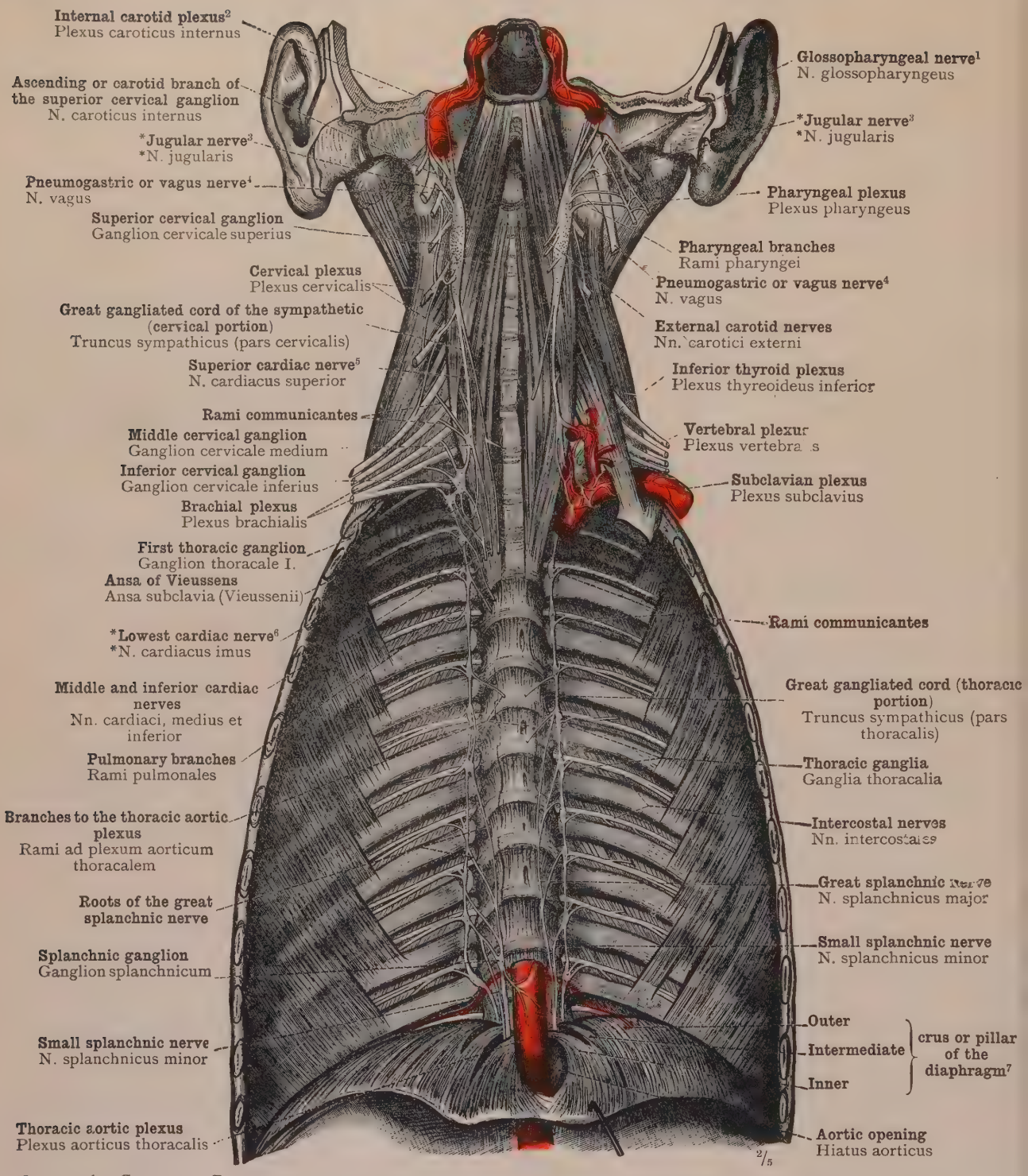


FIG. 1326.—CERVICAL PORTION, PARS CERVICALIS, AND THORACIC PORTION, PARS THORACALIS, OF THE GREAT GANGLIATED CORD OF THE SYMPATHETIC, WITH ITS GANGLIA (VERTEBRAL OR LATERAL GANGLIA OF GASKELL), GANGLIA TRUNCI SYMPATHICI; ITS CONTINUITY WITH THE INTERNAL CAROTID PLEXUS, PLEXUS CAROTICUS INTERNUS (*see note* [3] *to p.* 859), ITS COMMUNICATIONS WITH THE CEREBROSPINAL NERVES, AND ITS BRANCHES OF DISTRIBUTION. SEEN FROM BEFORE.

[1] *Ninth cranial nerve* in Soemmerring's enumeration; *first trunk* of the *eighth cranial nerve* in that of Willis.
[2] See note 3 to p. 859. [3] See Appendix, note 469.
[4] *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.
[5] Also known as the *superficial cardiac nerve.* [6] See Appendix, note 472. [7] See note [1] to p. 286, in Part III.

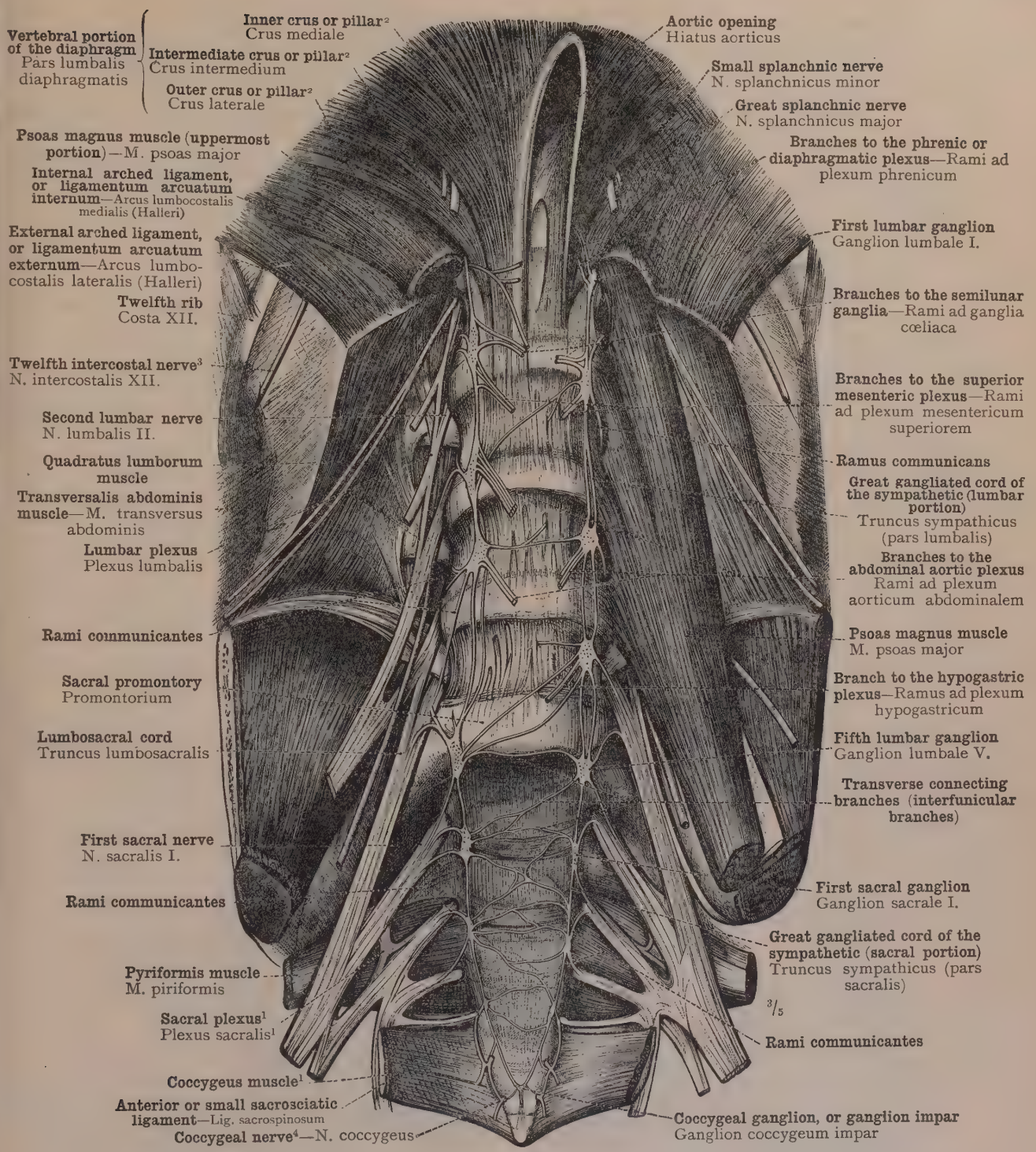
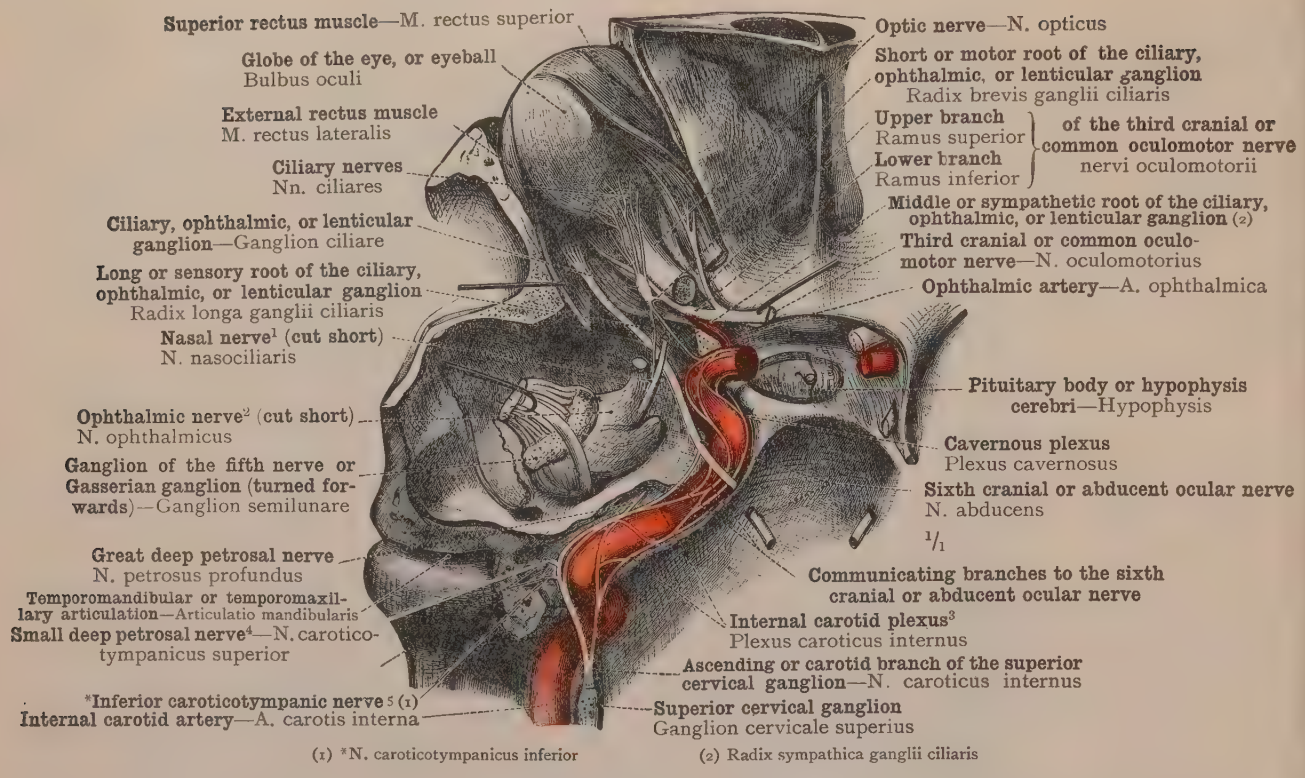


FIG. 1327.—LUMBAR PORTION, PARS LUMBALIS, AND SACRAL PORTION, PARS SACRALIS, OF THE GREAT GANGLIATED CORD OF THE SYMPATHETIC, WITH ITS GANGLIA (VERTEBRAL OR LATERAL GANGLIA OF GASKELL), GANGLIA TRUNCI SYMPATHICI; ITS COMMUNICATIONS WITH THE SPINAL NERVES, AND ITS BRANCHES OF DISTRIBUTION. SEEN FROM BEFORE.

On the right side of the body the psoas magnus muscle, musculus psoas major, has been removed, in order to lay bare the lumbar plexus, plexus lumbalis, and the rami communicantes of the lumbar portion of the great gangliated cord of the sympathetic.

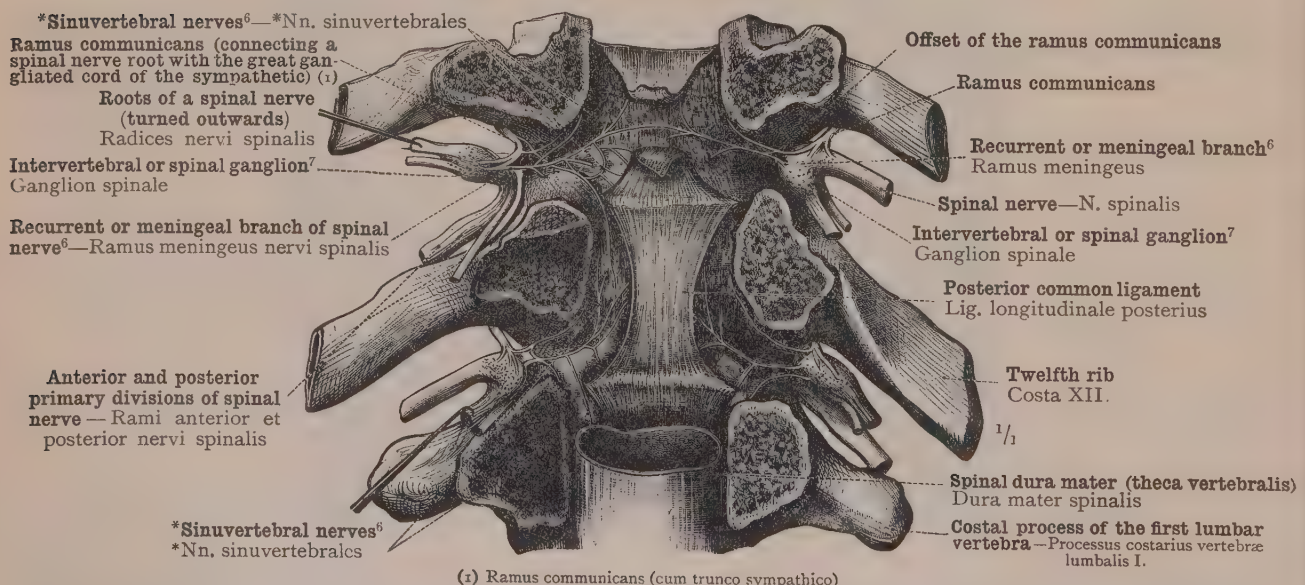
[1] The nervous plexus denoted here by the term *plexus sacralis* is by some English authors called the *sciatic plexus*, the *sacral plexus* according to these anatomists comprising both the *plexus sacralis* and *plexus pudendus* of Toldt. See Appendix, note 43[8].
[2] See note [1] to p. 286, in Part III. [3] Also known as the *subcostal nerve*. [4] See Appendix, note 43[8].


Superior rectus muscle—M. rectus superior
Globe of the eye, or eyeball
Bulbus oculi
External rectus muscle
M. rectus lateralis
Ciliary nerves
Nn. ciliares
Ciliary, ophthalmic, or lenticular ganglion—Ganglion ciliare
Long or sensory root of the ciliary, ophthalmic, or lenticular ganglion
Radix longa ganglii ciliaris
Nasal nerve[1] (cut short)
N. nasociliaris
Ophthalmic nerve[2] (cut short)
N. ophthalmicus
Ganglion of the fifth nerve or Gasserian ganglion (turned forwards)—Ganglion semilunare
Great deep petrosal nerve
N. petrosus profundus
Temporomandibular or temporomaxillary articulation—Articulatio mandibularis
Small deep petrosal nerve[4]—N. caroticotympanicus superior
*Inferior caroticotympanic nerve[5] (1)
Internal carotid artery—A. carotis interna
Optic nerve—N. opticus
Short or motor root of the ciliary, ophthalmic, or lenticular ganglion
Radix brevis ganglii ciliaris
Upper branch
Ramus superior
Lower branch
Ramus inferior
of the third cranial or common oculomotor nerve
nervi oculomotorii
Middle or sympathetic root of the ciliary, ophthalmic, or lenticular ganglion (2)
Third cranial or common oculomotor nerve—N. oculomotorius
Ophthalmic artery—A. ophthalmica
Pituitary body or hypophysis cerebri—Hypophysis
Cavernous plexus
Plexus cavernosus
Sixth cranial or abducent ocular nerve
N. abducens
1/1
Communicating branches to the sixth cranial or abducent ocular nerve
Internal carotid plexus[3]
Plexus caroticus internus
Ascending or carotid branch of the superior cervical ganglion—N. caroticus internus
Superior cervical ganglion
Ganglion cervicale superius

(1) *N. caroticotympanicus inferior (2) Radix sympathica ganglii ciliaris

FIG. 1328.—THE CEPHALIC PORTION, PARS CEPHALICA, OF THE SYMPATHETIC NERVOUS SYSTEM. SEEN OBLIQUELY FROM ABOVE AND BEHIND.

The carotid canal, canalis caroticus, and the cavernous sinus, sinus cavernosus, have been opened throughout, and the outer wall and also a part of the upper wall of the left orbit have been cut away. The ganglion of the fifth cranial nerve or Gasserian ganglion, ganglion semilunare (Gasseri), has been turned forwards.


*Sinuvertebral nerves[6]—*Nn. sinuvertebrales
Ramus communicans (connecting a spinal nerve root with the great ganglia ted cord of the sympathetic) (1)
Roots of a spinal nerve (turned outwards)
Radices nervi spinalis
Intervertebral or spinal ganglion[7]
Ganglion spinale
Recurrent or meningeal branch of spinal nerve[6]—Ramus meningeus nervi spinalis
Anterior and posterior primary divisions of spinal nerve—Rami anterior et posterior nervi spinalis
*Sinuvertebral nerves[6]
*Nn. sinuvertebrales
Offset of the ramus communicans
Ramus communicans
Recurrent or meningeal branch[6]
Ramus meningeus
Spinal nerve—N. spinalis
Intervertebral or spinal ganglion[7]
Ganglion spinale
Posterior common ligament
Lig. longitudinale posterius
Twelfth rib
Costa XII.
1/1
Spinal dura mater (theca vertebralis)
Dura mater spinalis
Costal process of the first lumbar vertebra—Processus costarius vertebræ lumbalis I.

(1) Ramus communicans (cum trunco sympathico)

FIG. 1329.—THE NERVES OF THE SPINAL OR NEURAL CANAL (INTRASPINAL NERVES, *SINUVERTEBRAL NERVES, *NERVI SINUVERTEBRALES—*see Appendix, note* [473]), AS SEEN ON THE POSTERIOR SURFACE OF THE BODIES OF THE ELEVENTH AND TWELFTH DORSAL VERTEBRÆ WHEN THE NEURAL ARCHES HAVE BEEN CUT AWAY AND THE SPINAL CORD REMOVED FROM BEHIND.

The roots of the spinal nerves with the intervertebral or spinal ganglia (ganglia of the posterior root) have been turned outwards.

1 Also known as the *oculonasal* and as the *nasociliary nerve.*
2 Or *first division* of the *fifth cranial, trifacial,* or *trigeminal nerve.*
3 See note 3 to p. 859.
4 See Appendix, notes 452 and 468.
5 See Appendix, note 468.
6 See Appendix, note 473.
7 Also called the *ganglion of the posterior root.*

Pars cephalica systematis sympathici—The cephalic portion of the sympathetic nervous system.—*Nervi sinuvertebrales—The *sinuvertebral (intraspinal) nerves.

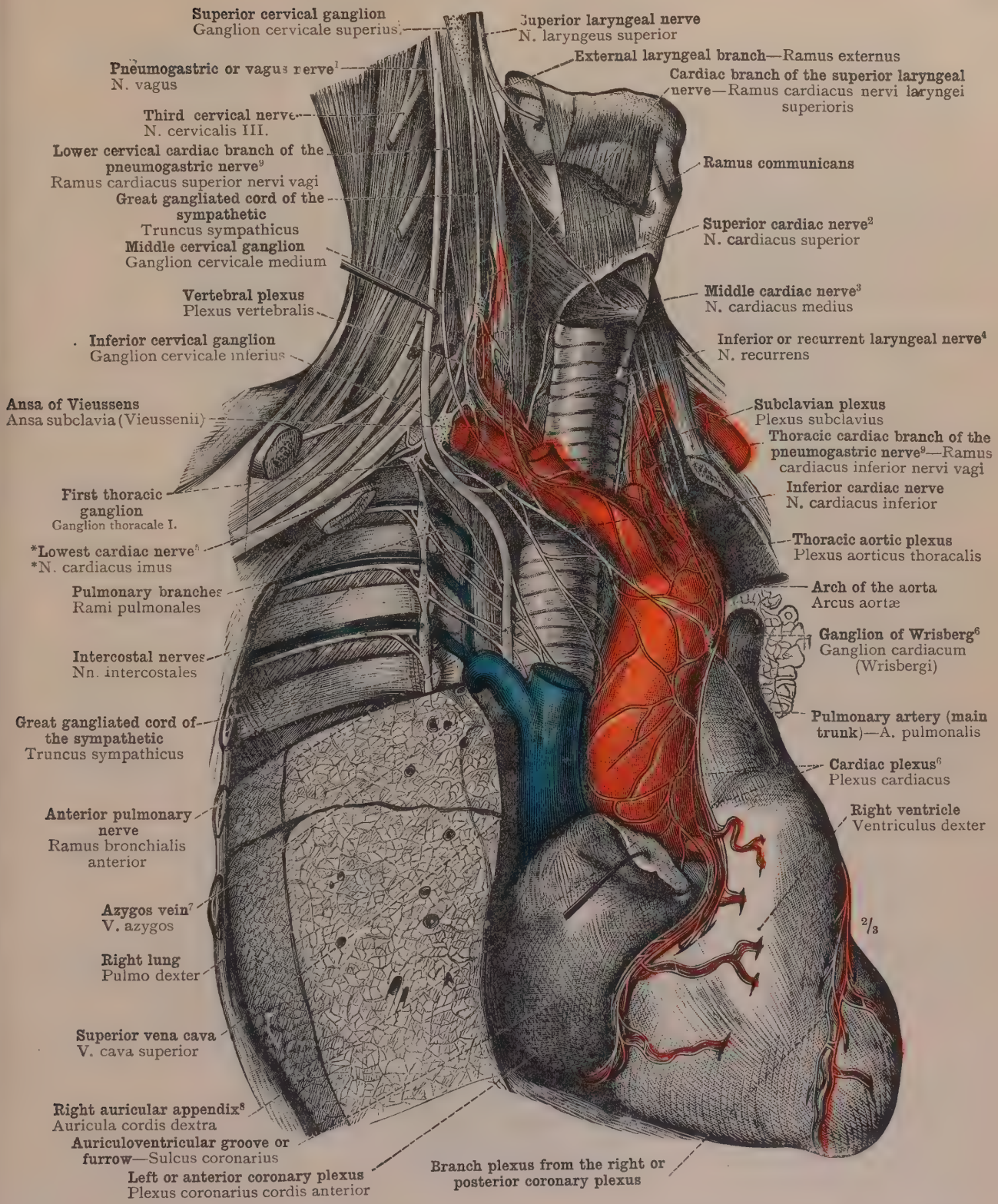


FIG. 1330.—THE CARDIAC NERVES, NN. CARDIACI, AND THE CARDIAC PLEXUS, PLEXUS CARDIACUS (*see Appendix, note* [471]), SEEN FROM THE RIGHT SIDE.

The anterior and upper portions of the right lung have been cut away.

1 *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.
2 Also known as the *superficial cardiac nerve.*
3 Also known as the *deep* or *great cardiac nerve.*
4 See Appendix, note [452].
5 See Appendix, note [472].
6 See Appendix, note [471]
7 Also called the *right* or *large azygos vein.*
8 See Appendix to Part V., note [113].
9 See Appendix, note [422].

Pars thoracalis systematis sympathici—Thoracic portion of the sympathetic nervous system.

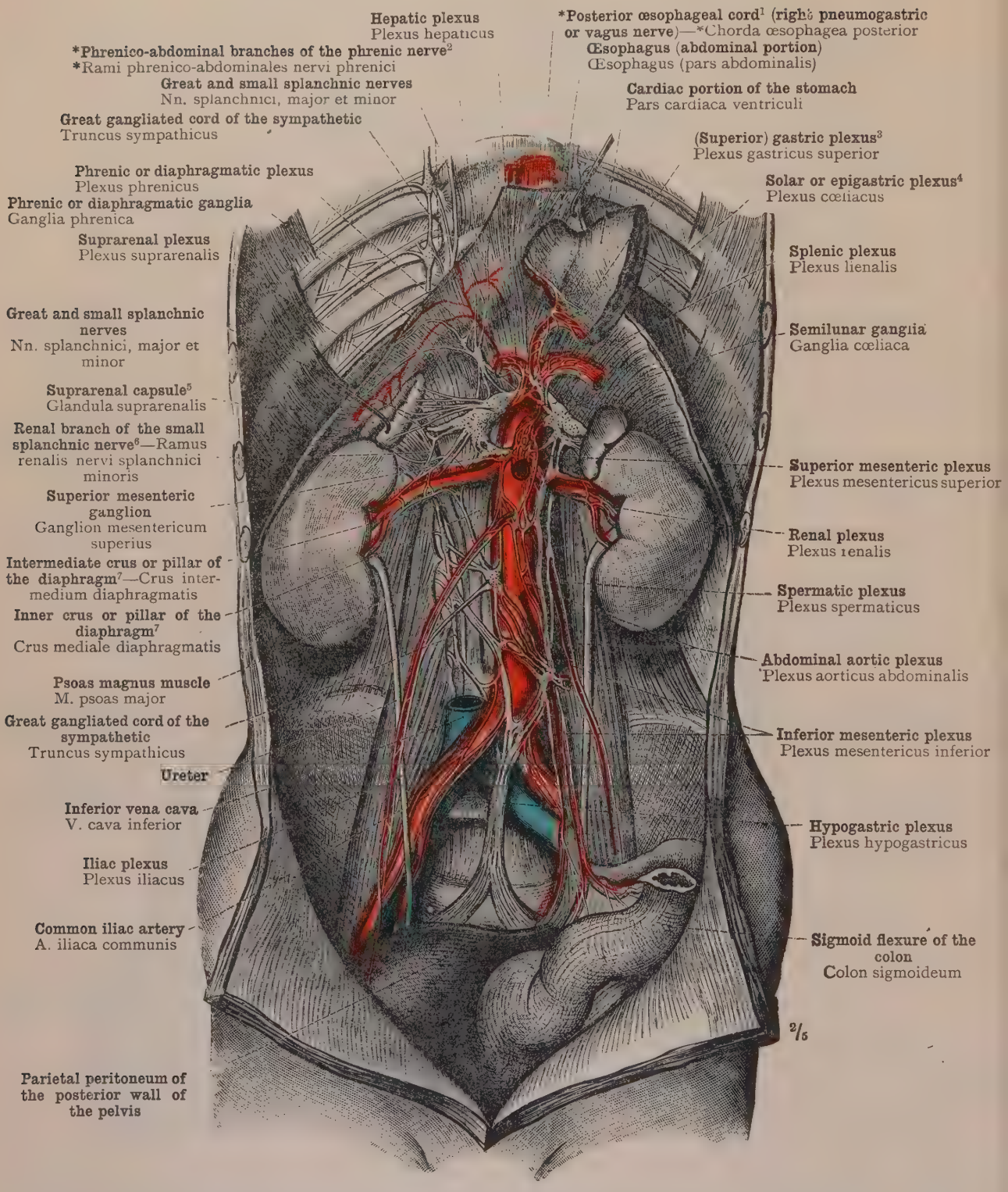
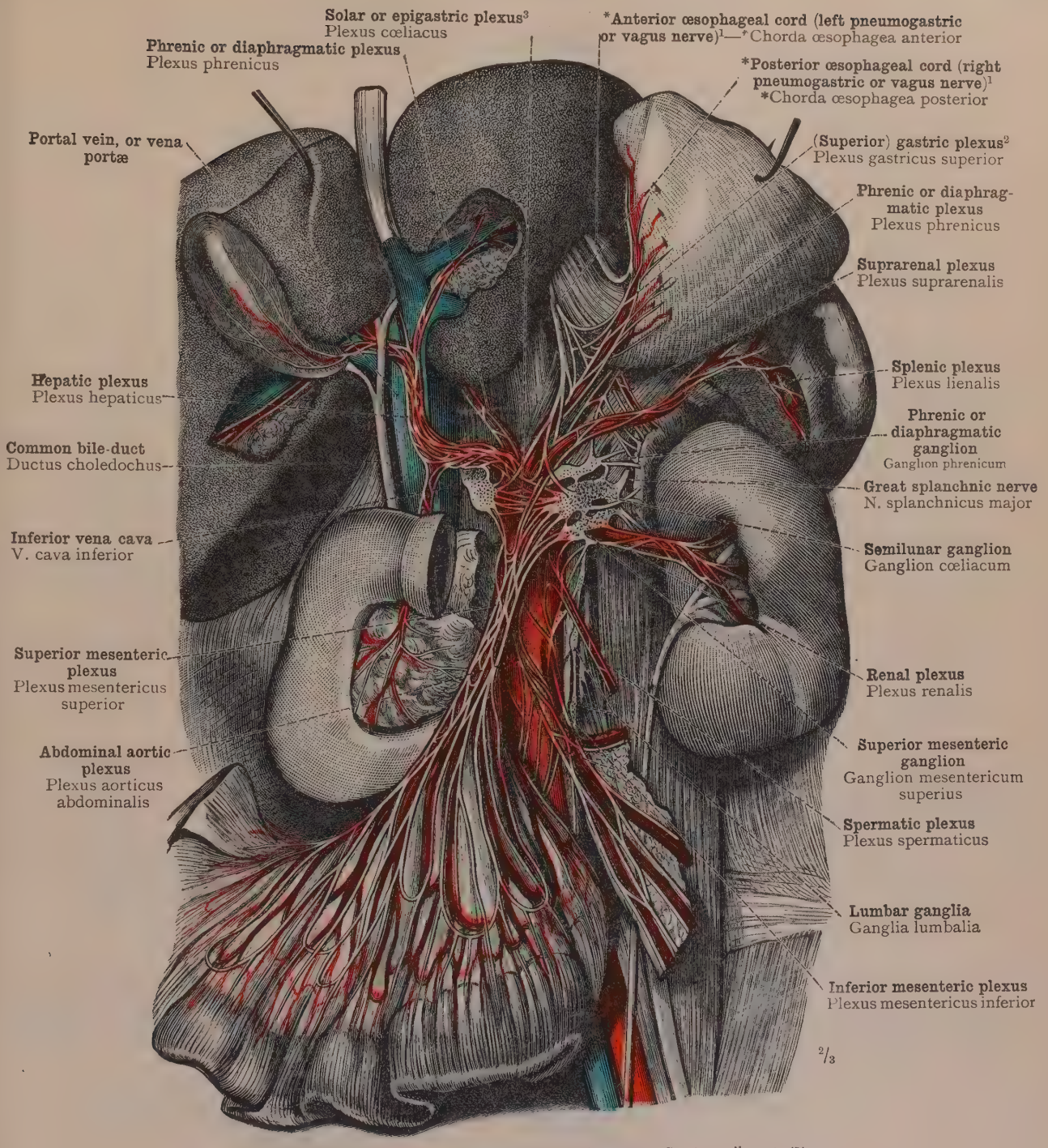


FIG. 1331.—THE GANGLIA OF THE PLEXUSES OF THE SYMPATHETIC (PREVERTEBRAL OR COLLATERAL GANGLIA OF GASKELL), GANGLIA PLEXUUM SYMPATHICORUM, AND THE FORMATION OF THE PLEXUSES OF THE SYMPATHETIC, PLEXUS SYMPATHICI, IN THE RETROPERITONEAL SPACE. SEEN FROM BEFORE.

1 See Appendix, note 464. 2 See Appendix, note 424. 3 See Appendix, note 465. 4 See Appendix, note 474.
5 Called also *suprarenal body*, or *adrenal*. 6 See Appendix, note 475. 7 See note 1 to p. 286, in Part III.

Pars abdominalis systematis sympathici—Abdominal portion of the sympathetic nervous system.

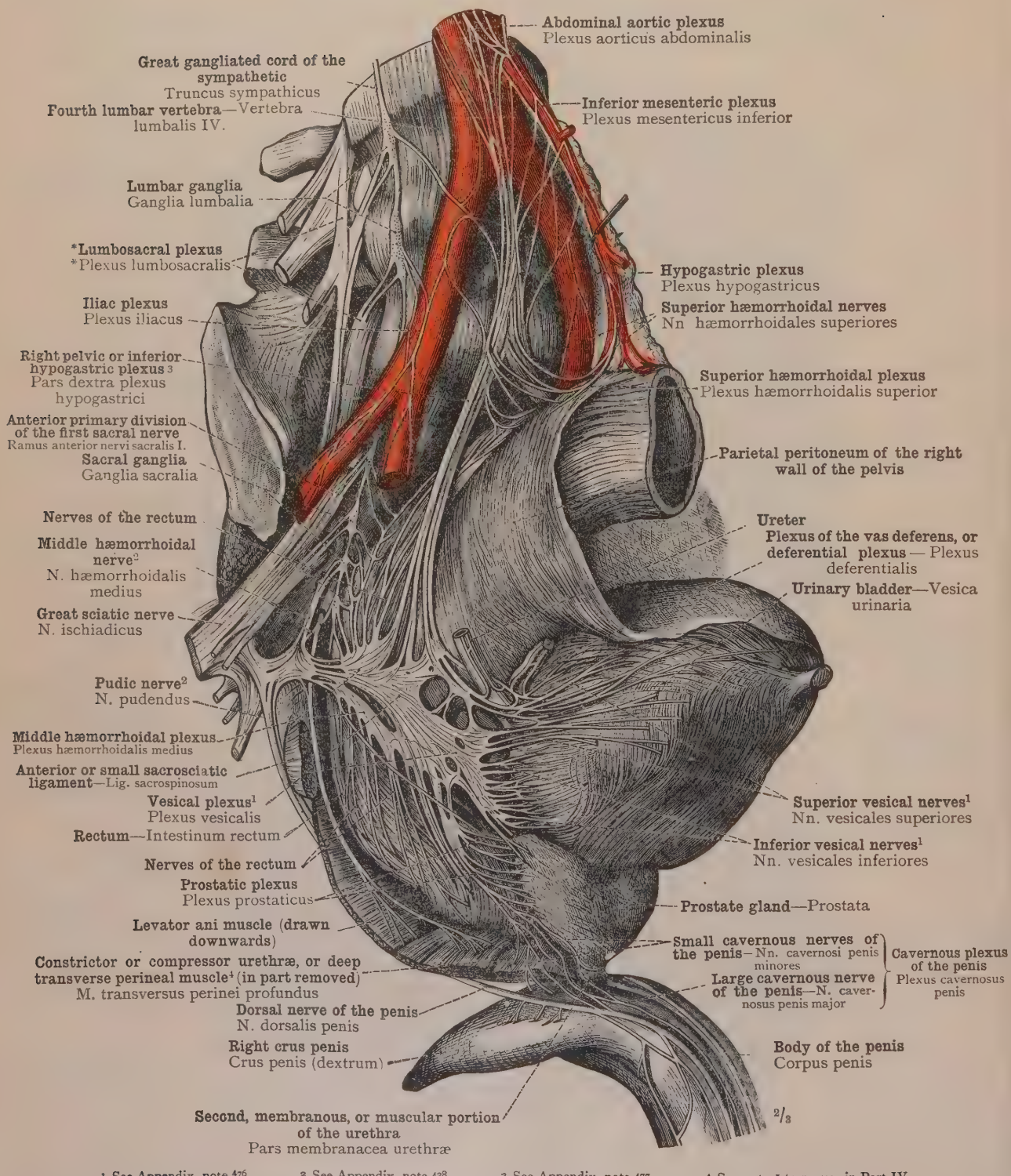


1 See Appendix, note 464. 2 See Appendix, note 465. 3 See Appendix, note 474

FIG. 1332.—THE SEMILUNAR GANGLIA, GANGLIA CŒLIACA, WITH THE SYMPATHETIC PLEXUSES, PLEXUS SYMPATHICI, OF THE ABDOMINAL VISCERA, RADIATING FROM THESE GANGLIA.

The uppermost portion only of the stomach has been retained, in connexion with the œsophagus, and this portion, together with the liver, has been turned upwards. The pancreas was cut across at the junction of the head and the body (*i.e.*, the neck of the organ, according to English writers—see Fig. 720, p. 441, in Part IV.), and the body of the gland was removed. The arteries and nerves of the mesentery have been exposed by the removal of the peritoneum covering them.

Pars abdominalis systematis sympathici—Abdominal portion of the sympathetic nervous system.



1 See Appendix, note 476. 2 See Appendix, note 438. 3 See Appendix, note 477. 4 See note 1 to p. 527, in Part IV.

FIG. 1333.—THE HYPOGASTRIC AND PELVIC PLEXUSES, PLEXUS HYPOGASTRICUS (*see Appendix, note* 477), THE PARENT PLEXUSES FROM WHICH THE SYMPATHETIC PLEXUSES OF THE PELVIC VISCERA ARE DERIVED, AND THE SHARE TAKEN BY THE SACRAL PORTION OF THE GREAT SYMPATHETIC CORD IN THEIR FORMATION. THE PUDIC PLEXUS, PLEXUS PUDENDUS (*see Appendix, note* 438).

Pars pelvina systematis sympathici—Pelvic portion of the sympathetic nervous system.

ORGANA SENSUUM

THE ORGANS OF THE SENSES

ORGANON VISUS

THE EYE

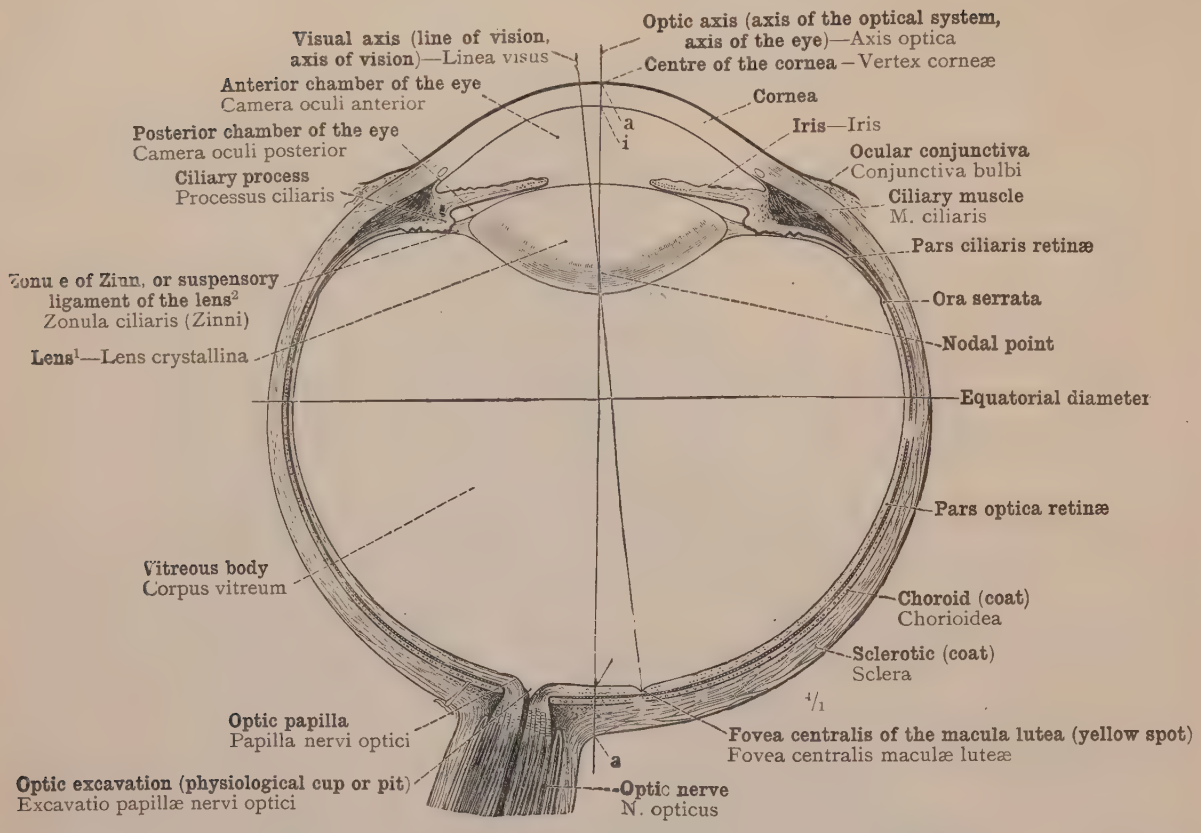
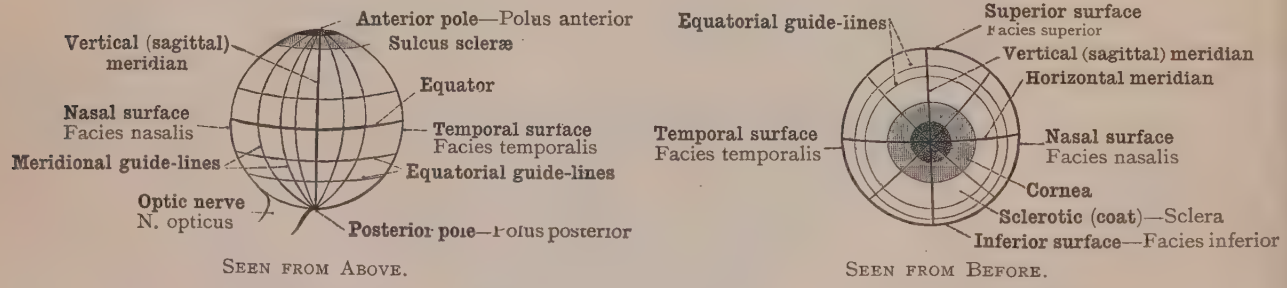
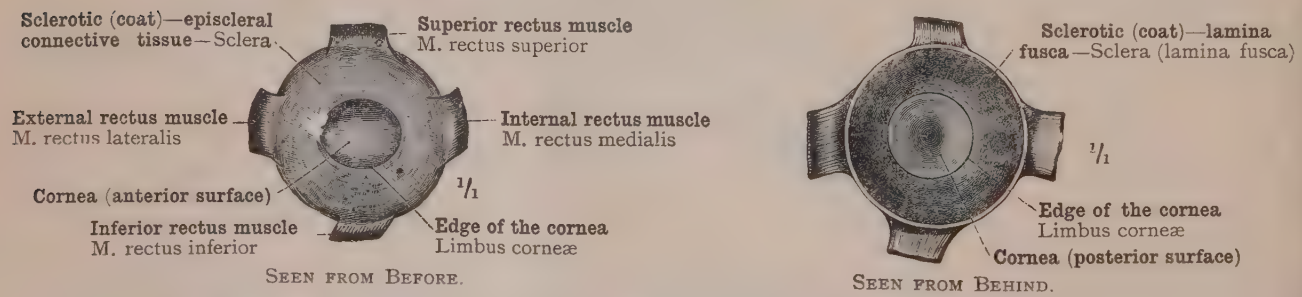


FIG. 1334.—DIAGRAM OF A HORIZONTAL SECTION OF THE RIGHT EYE. VISUAL AXIS, LINEA VISUS; OPTIC AXIS, AXIS OPTICA; aa, EXTERNAL AXIS OF THE EYE, AXIS OCULI EXTERNA; ii, INTERNAL AXIS OF THE EYE, AXIS OCULI INTERNA.



SEEN FROM ABOVE. SEEN FROM BEFORE.

FIG. 1335.—TERMS COMMONLY EMPLOYED IN THE ORIENTATION OF THE EYEBALL. RIGHT EYE.



SEEN FROM BEFORE. SEEN FROM BEHIND.

FIG. 1336.—THE ANTERIOR HEMISPHERE OF THE EXTERNAL FIBROUS COAT OF THE EYEBALL, TUNICA FIBROSA OCULI, CONSISTING OF TWO PARTS: THE SCLEROTIC (COAT), (TUNICA) SCLERA, AND THE CORNEA.

[1] In full known as the *crystalline lens*, but more commonly spoken of as the *lens* without the qualifying adjective. [2] See Appendix, note 480

Bulbus oculi—The globe of the eye, or eyeball.—**Tunica fibrosa oculi**—The external fibrous coat of the eyeball.

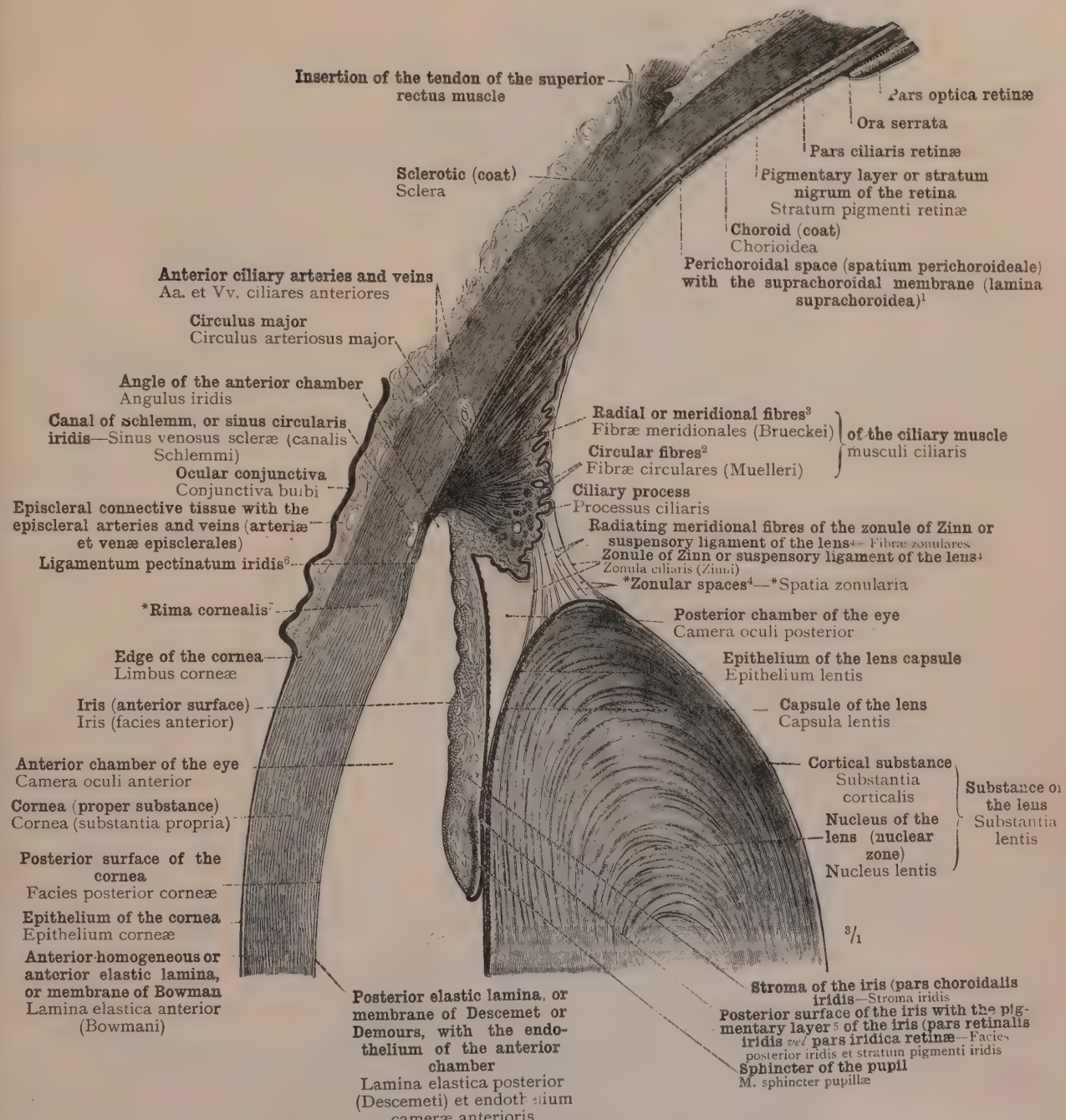

Insertion of the tendon of the superior rectus muscle
Pars optica retinæ
Ora serrata
Pars ciliaris retinæ
Sclerotic (coat)
Sclera
Pigmentary layer or stratum nigrum of the retina
Stratum pigmenti retinæ
Choroid (coat)
Chorioidea
Perichoroidal space (spatium perichoroideale) with the suprachoroidal membrane (lamina suprachoroidea)[1]
Anterior ciliary arteries and veins
Aa. et Vv. ciliares anteriores
Circulus major
Circulus arteriosus major
Angle of the anterior chamber
Angulus iridis
Canal of Schlemm, or sinus circularis iridis—Sinus venosus sclerae (canalis Schlemmi)
Ocular conjunctiva
Conjunctiva bulbi
Episcleral connective tissue with the episcleral arteries and veins (arteriæ et venæ episclerales)
Ligamentum pectinatum iridis[6]
*Rima cornealis
Edge of the cornea
Limbus corneæ
Iris (anterior surface)
Iris (facies anterior)
Anterior chamber of the eye
Camera oculi anterior
Cornea (proper substance)
Cornea (substantia propria)
Posterior surface of the cornea
Facies posterior corneæ
Epithelium of the cornea
Epithelium corneæ
Anterior homogeneous or anterior elastic lamina, or membrane of Bowman
Lamina elastica anterior (Bowmani)
Radial or meridional fibres[3]
Fibræ meridionales (Brueckei)
Circular fibres[2]
Fibræ circulares (Muelleri)
of the ciliary muscle
musculi ciliaris
Ciliary process
Processus ciliaris
Radiating meridional fibres of the zonule of Zinn or suspensory ligament of the lens[4]—Fibræ zonulares
Zonule of Zinn or suspensory ligament of the lens[4]
Zonula ciliaris (Zinni)
*Zonular spaces[4]—*Spatia zonularia
Posterior chamber of the eye
Camera oculi posterior
Epithelium of the lens capsule
Epithelium lentis
Capsule of the lens
Capsula lentis
Cortical substance
Substantia corticalis
Nucleus of the lens (nuclear zone)
Nucleus lentis
Substance of the lens
Substantia lentis
3/1
Posterior elastic lamina, or membrane of Descemet or Demours, with the endothelium of the anterior chamber
Lamina elastica posterior (Descemeti) et endothelium cameræ anterioris
Stroma of the iris (pars choroidalis iridis—Stroma iridis
Posterior surface of the iris with the pigmentary layer[5] of the iris (pars retinalis iridis vel pars iridica retinæ—Facies posterior iridis et stratum pigmenti iridis
Sphincter of the pupil
M. sphincter pupillæ

FIG. 1337.—THE UPPER HALF OF A SAGITTAL SECTION THROUGH THE FRONT OF THE EYEBALL. THE LAYERS OF THE THREE COATS OF THE EYEBALL; THE ANTERIOR AND POSTERIOR CHAMBERS CAMERA OCULI ANTERIOR ET CAMERA OCULI POSTERIOR. THE RELATIONS OF THE LENS, LENS CRYSTALLINA, TO THE CILIARY BODY, CORPUS CILIARE, AND TO THE IRIS. THE CILIARY MUSCLE, M. CILIARIS, AND THE ZONULE OF ZINN OR SUSPENSORY LIGAMENT OF THE LENS, ZONULA CILIARIS ZINNI (*see Appendix, note* [480]).

1 See Appendix, note 478. 2 See Appendix, note 479. 3 Constituting what is sometimes called the *radial ciliary muscle* (Macalister, *op. cit.*, p. 670).
4 See Appendix, note 480. 5 Also called the *uveal pigment* of the iris. 6 Sometimes called the *pillars of the iris.* 7 See Appendix, note 481.

Sagittal Section of the Eyeball.

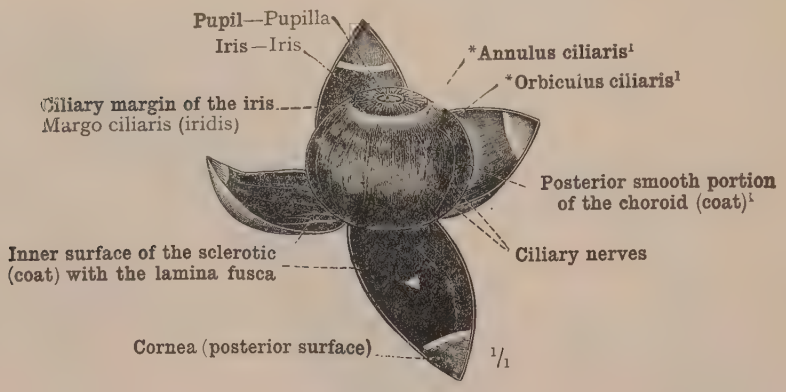


FIG. 1338.—THE MIDDLE OR VASCULAR COAT OF THE EYEBALL, TUNICA UVEA *SEU* VASCULOSA OCULI, EXPOSED FROM WITHOUT; ITS TWO PORTIONS, THE IRIS AND THE CHOROID (COAT), CHORIOIDEA. LEFT EYE, SEEN OBLIQUELY FROM ABOVE AND BEFORE.

The external coat of the eyeball was divided into four segments by meridional incisions extending backwards as far as the entrance of the optic nerve into the globe, and these segments were turned backwards.

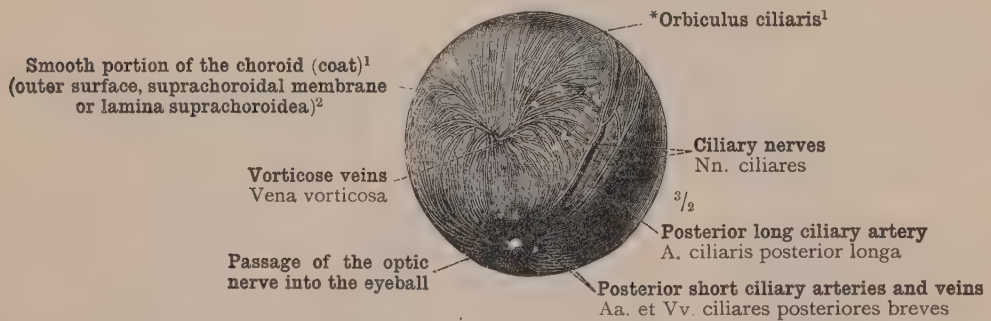

*Orbiculus ciliaris[1]
Smooth portion of the choroid (coat)[1] (outer surface, suprachoroidal membrane or lamina suprachoroidea)[2]
Ciliary nerves
Nn. ciliares
Vorticose veins
Vena vorticosa
3/2
Posterior long ciliary artery
A. ciliaris posterior longa
Passage of the optic nerve into the eyeball
Posterior short ciliary arteries and veins
Aa. et Vv. ciliares posteriores breves

FIG. 1339.—THE POSTERIOR PORTION OF THE CHOROID (COAT), DISPLAYED FROM WITHOUT BY THE COMPLETE REMOVAL OF THE EXTERNAL COAT OF THE EYEBALL. RIGHT EYE, SEEN FROM ABOVE AND BEHIND, WITH THE TEMPORAL SURFACE OF THE EYEBALL ROTATED A LITTLE UPWARDS.

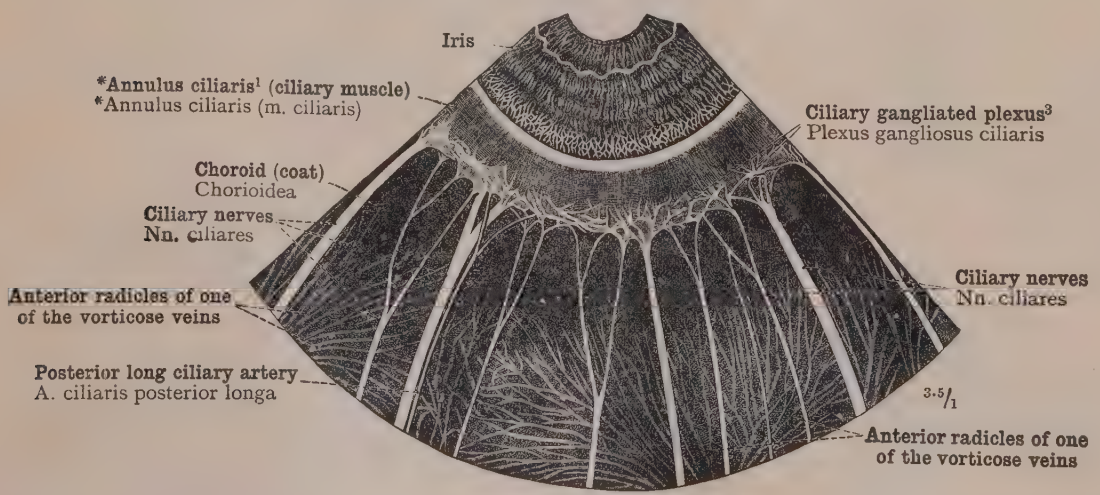


FIG. 1340.—THE CILIARY GANGLIATED PLEXUS (*see Appendix, note* 483), PLEXUS GANGLIOSUS CILIARIS, AND THE CILIARY NERVES ENTERING THIS PLEXUS. OUTER SURFACE OF THE MIDDLE OR VASCULAR COAT OF THE EYEBALL.

[1] See Appendix, note 482. [2] See Appendix, note 478. [3] See Appendix, note 483

Tunica vasculosa *seu* uvea oculi—The middle or vascular coat of the eyeball.

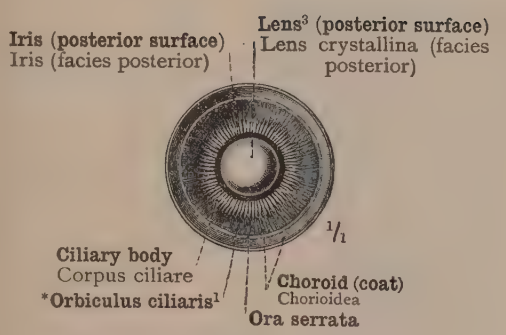


FIG. 1341.—THE INNER SURFACE OF THE ANTERIOR PORTION OF THE CHOROID (COAT), WITH THE LENS. THE CORONA CILIARIS (*see Appendix, note* [485]). SEEN FROM BEHIND.

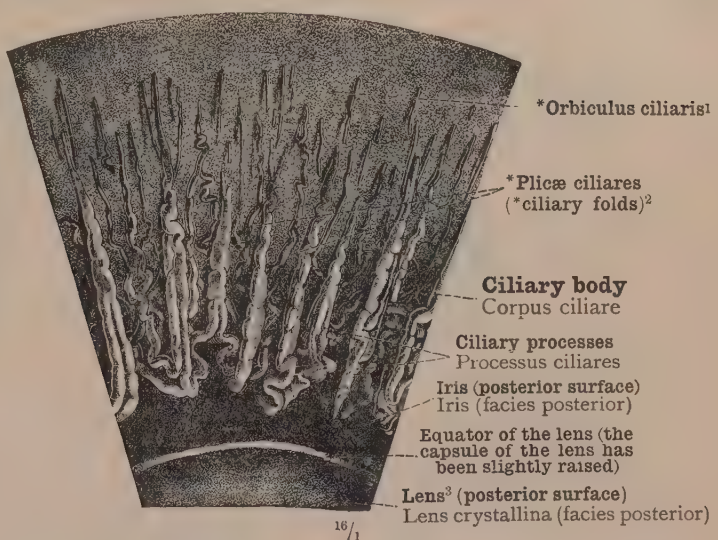


FIG. 1342.—A PORTION OF THE CORONA CILIARIS (*see Appendix, note* [485]), MAGNIFIED. THE CILIARY PROCESSES, PROCESSUS CILIARES, AND THE *CILIARY FOLDS, *PLICÆ CILIARES (*see Appendix, note* [485]).

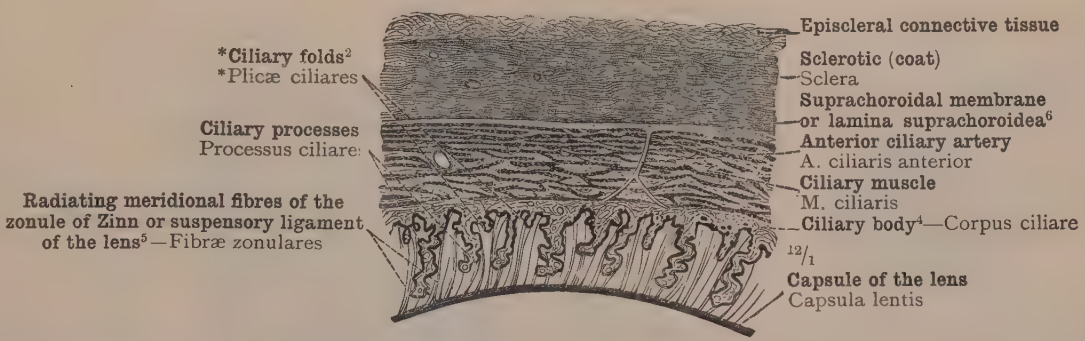


FIG. 1343.—A PORTION OF A CORONAL SECTION THROUGH THE CILIARY BODY, CORPUS CILIARE, AND THE SCLEROTIC (COAT), SCLERA. THE CILIARY PROCESSES AND THE LAYERS OF THE CILIARY MUSCLE, M. CILIARIS, ARE SEEN IN TRANSVERSE SECTION. THE CAPSULE OF THE LENS, WHICH IS ALSO SEEN IN THE SECTION, IS CONNECTED WITH THE CILIARY BODY BY MEANS OF THE FIBRÆ ZONULARES (RADIATING MERIDIONAL FIBRES OF THE ZONULE OF ZINN OR SUSPENSORY LIGAMENT OF THE LENS—*see Appendix, note* [490]).

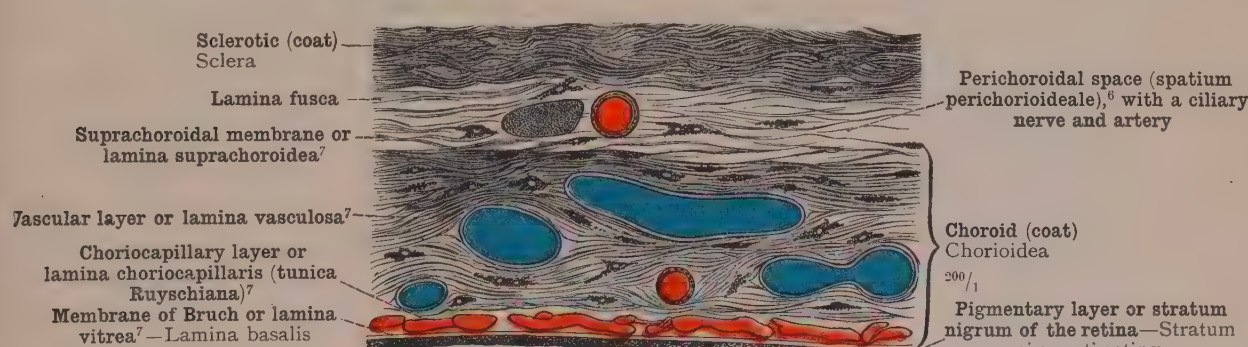

Sclerotic (coat)
Sclera
Lamina fusca
Suprachoroidal membrane or lamina suprachoroidea[7]
Vascular layer or lamina vasculosa[7]
Choriocapillary layer or lamina choriocapillaris (tunica Ruyschiana)[7]
Membrane of Bruch or lamina vitrea[7]—Lamina basalis
Perichoroidal space (spatium perichorioideale),[6] with a ciliary nerve and artery
Choroid (coat)
Chorioidea
200/1
Pigmentary layer or stratum nigrum of the retina—Stratum pigmenti retinæ

FIG. 1344.—THE LAYERS OF THE CHOROID (COAT), AS SEEN IN A CORONAL SECTION THROUGH THE POSTERIOR SMOOTH PORTION (*see Appendix, note* [482]) OF THAT TUNIC (*see Appendix, note* [486]). IN THE PERICHOROIDAL SPACE, SPATIUM PERICHORIOIDEALE (*see Appendix, note* [478]), A CILIARY ARTERY, A. CILIARIS, AND A CILIARY NERVE, N. CILIARIS, ARE SEEN IN TRANSVERSE SECTION.

[1] See Appendix, note [482]. [2] See Appendix, note [484]. [3] See note [1] to p. 892. [4] See Appendix, note [485]
[5] See Appendix, note [480]. [6] See Appendix, note [478]. [7] See Appendix, note [486].

Tunica vasculosa *seu* **uvea oculi**—The middle or vascular coat of the eyeball.

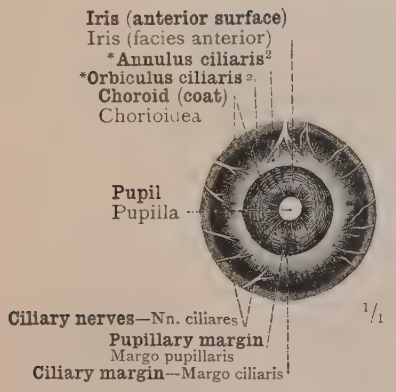


FIG. 1345.—THE IRIS OF A DARK BROWN EYE, WITH THE ADJOINING PORTIONS OF THE CHOROID (COAT). SEEN FROM BEFORE.

Ciliary gangliated plexus[1]
Plexus gangliosus ciliaris
*Annulus ciliaris[2] (ciliary muscle, radial or meridional fibres)[3]
*Annulus ciliaris (m. ciliaris, fibræ meridionales)
Choroid (coat)
Chorioidea
Attached remnant of the corneal margin
Ciliary margin (of the iris)—Margo ciliaris (iridis)
Loosely woven marginal portion of thestroma of the iris[4]
*Annulus iridis major (ciliary zone of the iris)
*Plicæ iridis (contraction-folds)[4]
Vascular eminences
Circulus minor
Circulus iridis minor
Large pigment cell
*Annulus iridis minor (pupillary zone of the iris)[4]
*Crypts[4]
Pupillary margin (of the iris)
Margo pupillaris (iridis)
Free border of the pigmentary layer of the iris[5]
10/1

FIG. 1346.—A SECTOR OF THE IRIS DEPICTED IN FIG. 1345, MAGNIFIED. ANTERIOR SURFACE.

FIG. 1347.—THE IRIS OF A LIGHT GREY EYE, WITH THE ADJOINING PORTIONS OF THE CHOROID (COAT). SEEN FROM BEFORE.

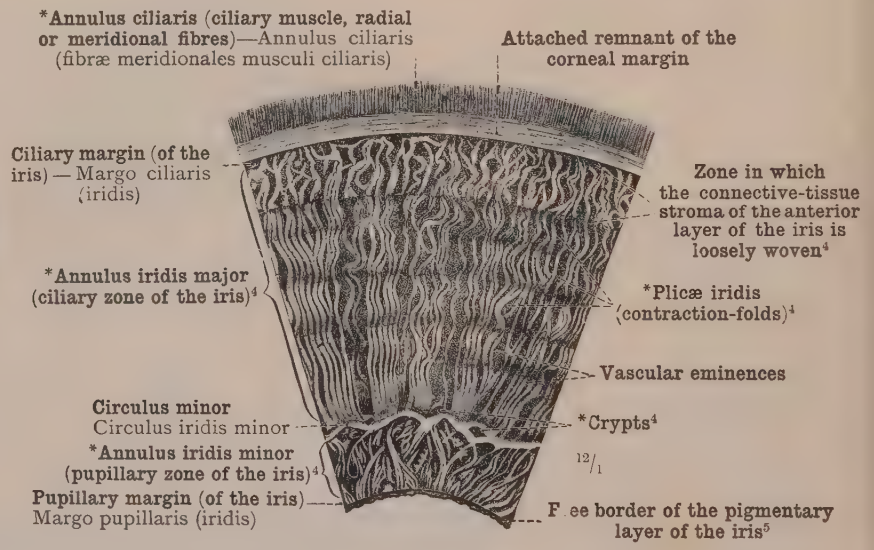

*Annulus ciliaris (ciliary muscle, radial or meridional fibres)—Annulus ciliaris (fibræ meridionales musculi ciliaris)
Attached remnant of the corneal margin
Ciliary margin (of the iris)—Margo ciliaris (iridis)
Zone in which the connective-tissue stroma of the anterior layer of the iris is loosely woven[4]
*Annulus iridis major (ciliary zone of the iris)[4]
*Plicæ iridis (contraction-folds)[4]
Vascular eminences
Circulus minor
Circulus iridis minor
*Crypts[4]
*Annulus iridis minor (pupillary zone of the iris)[4]
Pupillary margin (of the iris)
Margo pupillaris (iridis)
Free border of the pigmentary layer of the iris[5]
12/1

FIG. 1348.—A SECTOR OF THE IRIS DEPICTED IN FIG. 1347. ANTERIOR SURFACE.

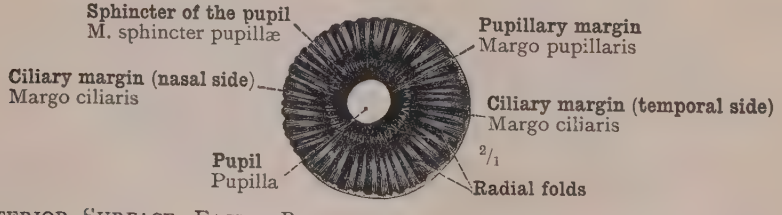


FIG. 1349.—THE POSTERIOR SURFACE, FACIES POSTERIOR, OF THE EXCISED IRIS OF A LIGHT GREY RIGHT EYE, AS SEEN WHEN THE PIGMENTARY LAYER (STRATUM PIGMENTI IRIDIS—*see Appendix, note* [438]) HAS BEEN COMPLETELY REMOVED. THE PUPIL, PUPILLA, IS NOT PRECISELY CENTRAL IN POSITION, BUT LIES A LITTLE TO THE NASAL SIDE AND ABOVE THE MIDDLE.

[1] See Appendix, note [482]. [2] See Appendix, note [482]. [3] See note 3 to p. 893. [4] See Appendix, note [487]. [5] See Appendix, note [488].

Tunica vasculosa *seu* uvea oculi—The middle or vascular coat of the eyeball.

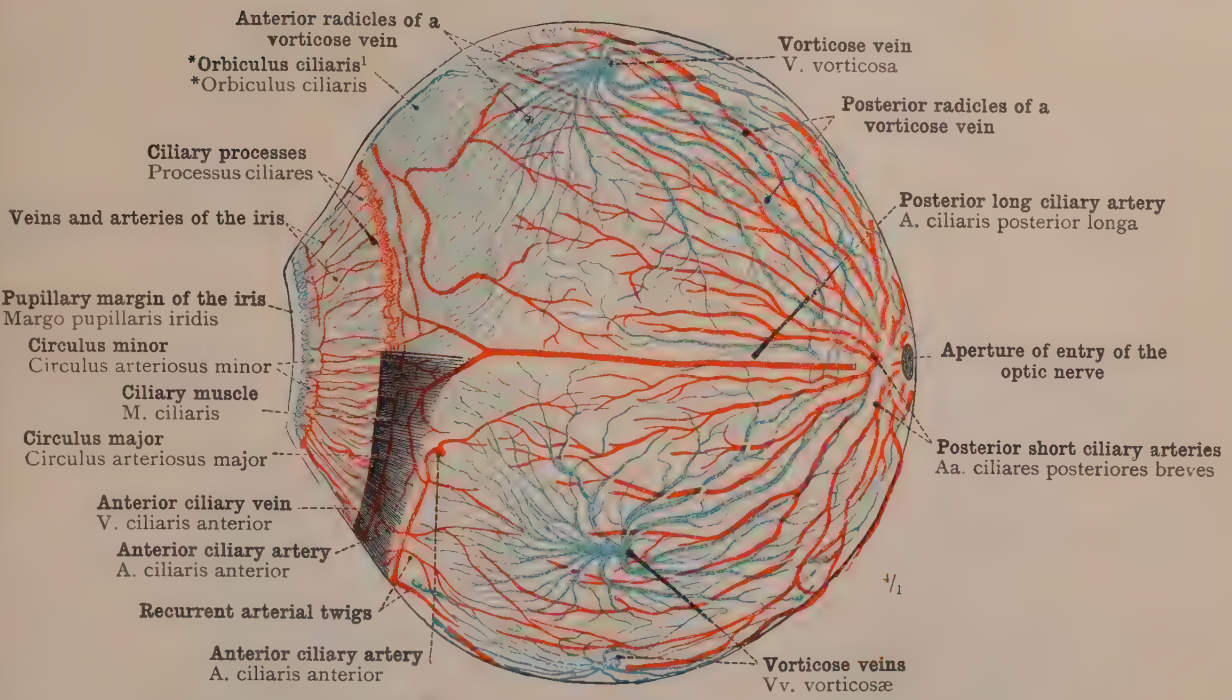


FIG. 1350.—DIAGRAMMATIC REPRESENTATION OF THE ARRANGEMENT OF THE BLOODVESSELS IN THE MIDDLE OR VASCULAR COAT OF THE EYEBALL. AFTER TH. LEBER. SEEN FROM THE OUTER SURFACE.

In the upper half of the preparation the ciliary muscle, musculus ciliaris, has been removed, so as to display the vessels of the ciliary processes.

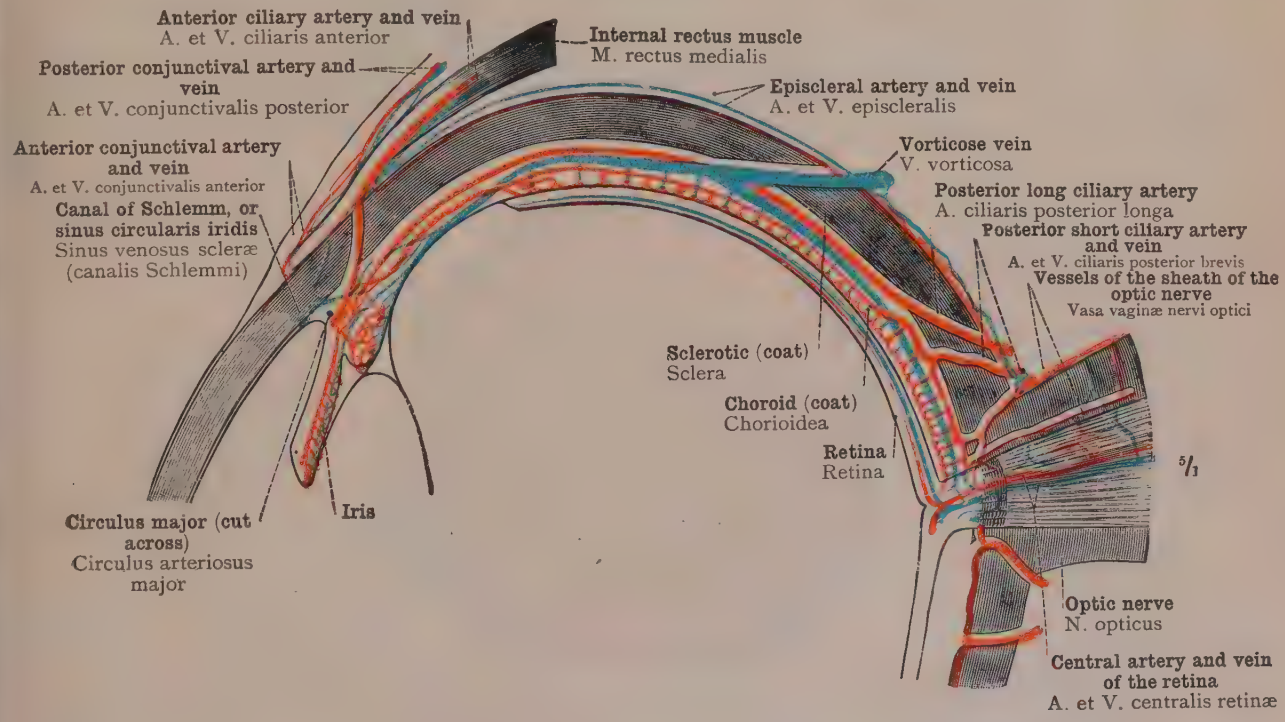


FIG. 1351.—DIAGRAMMATIC REPRESENTATION OF THE COURSE OF THE BLOODVESSELS IN THE EYEBALL. HORIZONTAL SECTION. AFTER TH. LEBER.

[1] See Appendix, note 482.

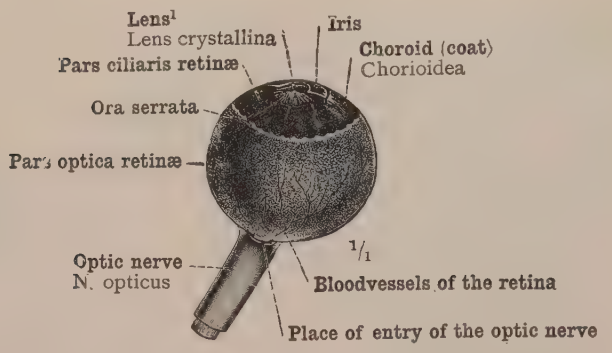


FIG. 1352.—THE INTERNAL COAT OF THE EYEBALL, THE RETINA, IN CONNEXION WITH THE OPTIC NERVE, EXPOSED BY THE REMOVAL OF THE EXTERNAL AND MIDDLE COAT. ITS TWO PARTS, PARS OPTICA AND PARS CILIARIS, WITH THE ORA SERRATA AS THE BOUNDARY BETWEEN THEM. EXTERNAL SURFACE. RIGHT EYE, SEEN FROM ABOVE.

A part of the iris and a part of the ciliary body have been preserved.

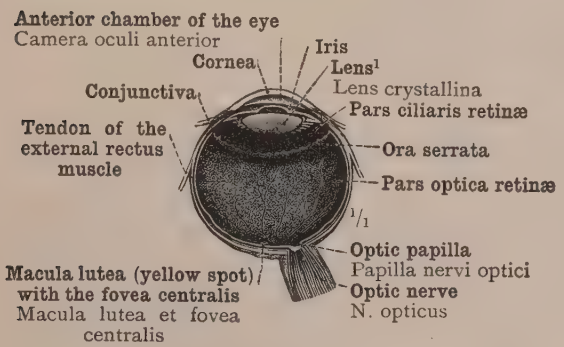


FIG. 1353.—THE RETINA IN CONNEXION WITH THE OPTIC NERVE, EXPOSED IN THE HORIZONTALLY HEMISECTED LEFT EYEBALL BY THE REMOVAL OF THE VITREOUS BODY. LOWER HALF OF THE EYEBALL. THE INTERIOR, SEEN FROM ABOVE.

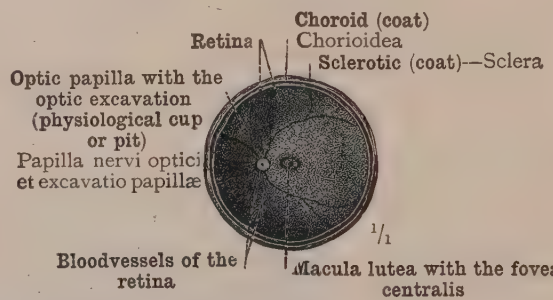


FIG. 1354.—THE POSTERIOR PORTION OF THE RETINA WITH THE OPTIC PAPILLA, PAPILLA NERVI OPTICI, AND THE YELLOW SPOT, MACULA LUTEA, AS SEEN IN A CORONALLY HEMISECTED LEFT EYEBALL. THE INTERIOR, SEEN FROM BEFORE.

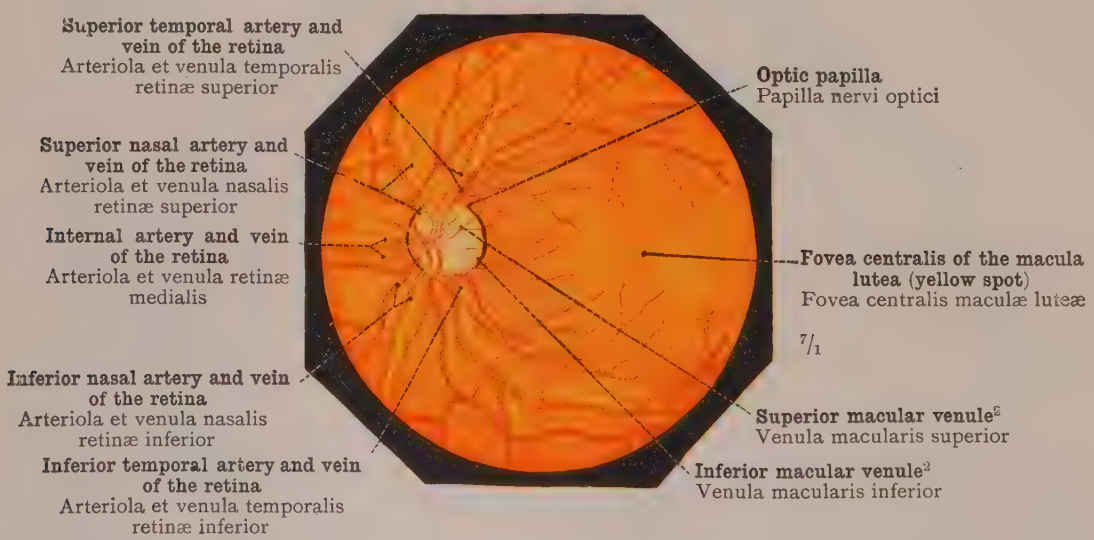

Superior temporal artery and vein of the retina
Arteriola et venula temporalis retinæ superior
Optic papilla
Papilla nervi optici
Superior nasal artery and vein of the retina
Arteriola et venula nasalis retinæ superior
Internal artery and vein of the retina
Arteriola et venula retinæ medialis
Fovea centralis of the macula lutea (yellow spot)
Fovea centralis maculæ luteæ
7/1
Inferior nasal artery and vein of the retina
Arteriola et venula nasalis retinæ inferior
Superior macular venule[2]
Venula macularis superior
Inferior temporal artery and vein of the retina
Arteriola et venula temporalis retinæ inferior
Inferior macular venule[2]
Venula macularis inferior

FIG. 1355.—THE FUNDUS OF THE EYEBALL WITH THE BLOODVESSELS OF THE RETINA, AS SEEN IN THE NORMAL LEFT EYE OF A DARK-HAIRED YOUNG MAN. ERECT IMAGE. AFTER E. V. JÄGER.

[1] See note [1] to p. 892. [2] See Appendix, note [489].

The Internal Coat of the Eye, or Retina.

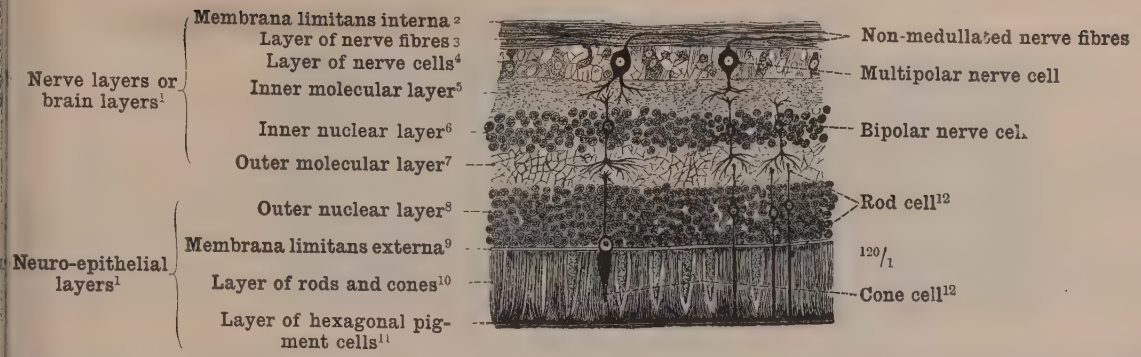


FIG. 1356.—THE LAYERS OF THE RETINA (*see notes* [1] *to* [12] *inclusive*), AS SEEN IN A SAGITTAL SECTION THE ARRANGEMENT OF THE ELEMENTARY PARTS IS REPRESENTED DIAGRAMMATICALLY.

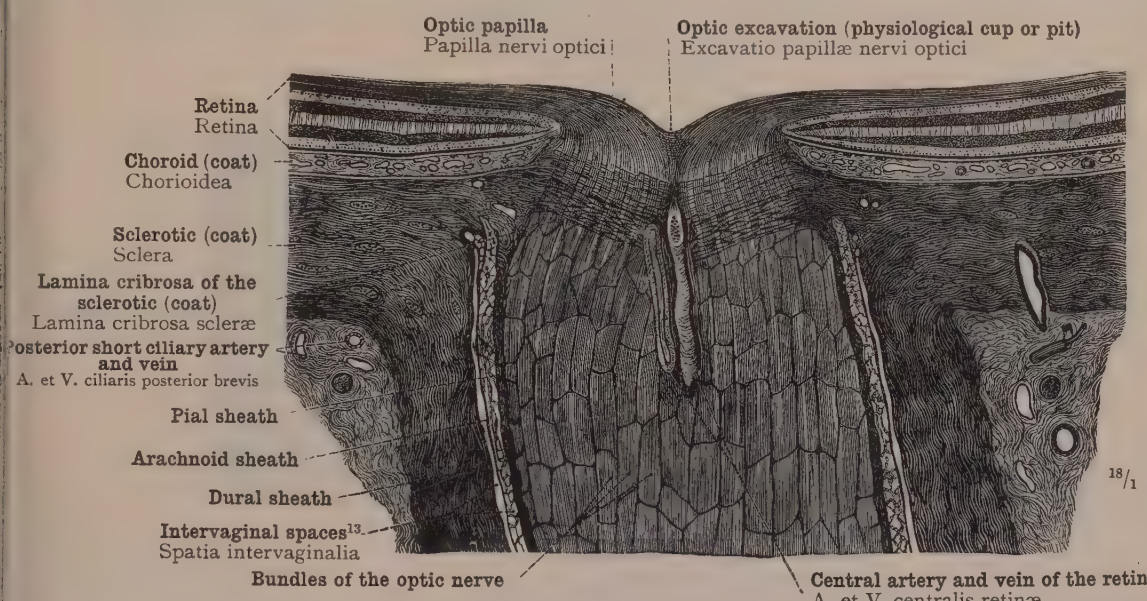


FIG. 1357.—THE TERMINAL PORTION OF THE OPTIC NERVE, N. OPTICUS, AND ITS ENTRANCE INTO THE EYEBALL, IN HORIZONTAL SECTION. THE SHEATHS OF THE OPTIC NERVE, VAGINÆ NERVI OPTICI, IN LONGITUDINAL SECTION.

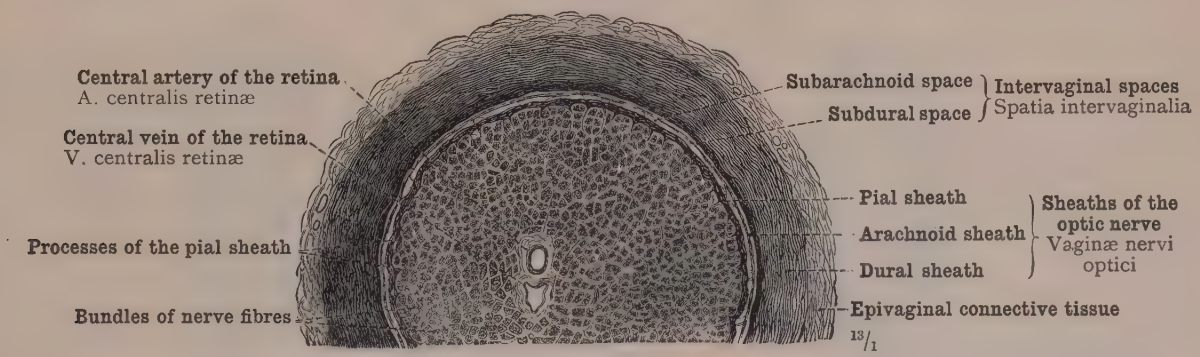


FIG. 1358.—PART OF A TRANSVERSE SECTION OF THE ANTERIOR PORTION OF THE OPTIC NERVE. THE SHEATHS OF THE OPTIC NERVE, VAGINÆ NERVI OPTICI, IN TRANSVERSE SECTION.

[1] See Appendix, note 490. [2] Sometimes spoken of in English as the *internal limiting membrane.*
[3] Or *stratum opticum.* [4] Also known as the *ganglion nervi optici*, both in the English and in the official German nomenclature.
[5] Al o known as the *inner reticular* or *inner plexiform layer*, and in Latin as the *neurospongium* or as the *stratum reticulare internum.*
[6] Also known as the *stratum granularum internum* or *ganglion retinæ.*
[7] Also known as the *outer reticular* or *outer plexiform layer*, and in Latin as the *stratum reticulare externum.*
[8] Also known as the *stratum granularum externum.*
[9] Sometimes spoken of in English as the *external limiting membrane.*
[10] Also known as the *bacillary layer*, or *stratum bacillorum.*
[11] The *pigmentary layer* of the retina is also known as the *stratum nigrum;* in the official German nomenclature it is the *stratum pigmenti retinæ.*
[12] See Appendix, note 491.
[13] Sometimes separately classed as *subdural* and *subarachnoid spaces of the optic nerves.* (See Fig. 1358.)

The Retina (the Internal Coat of the Eyeball).—Nervus opticus—The optic nerve.

FIG. 1359.—THE VITREOUS BODY, CORPUS VITREUM, REMOVED FROM THE EYE IN THE FRESH STATE, WITH THE SAUCER-SHAPED HOLLOW, FOSSA PATELLARIS (FOSSA HYALOIDEA), IN WHICH THE LENS LIES. SEEN OBLIQUELY FROM THE SIDE AND BEFORE.

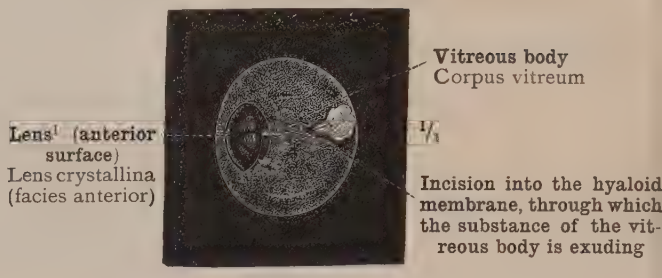

Vitreous body
Corpus vitreum
Lens[1] (anterior surface)
Lens crystallina (facies anterior)
1/1
Incision into the hyaloid membrane, through which the substance of the vitreous body is exuding

FIG. 1360.—THE VITREOUS BODY, CORPUS VITREUM, WITH THE LENS, LENS CRYSTALLINA, REMOVED FROM THE EYE IN THE FRESH STATE. THROUGH A SMALL INCISION IN THE HYALOID MEMBRANE, MEMBRANA HYALOIDEA, A PART OF THE SUBSTANCE OF THE VITREOUS BODY, CORPUS VITREUM, HAS EXUDED.

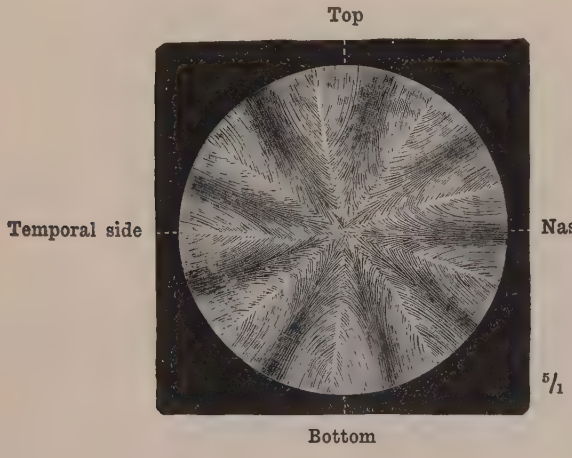


FIG. 1361.—ANTERIOR SURFACE, FACIES ANTERIOR.

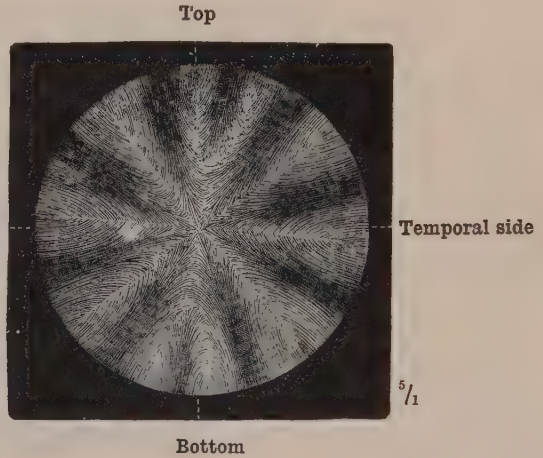


FIG. 1362.—POSTERIOR SURFACE, FACIES POSTERIOR.

THE LENS OF THE EYE, LENS CRYSTALLINA (*see note* [1] *to p.* 892), REMOVED FROM THE BODY WITHIN A FEW HOURS AFTER DEATH, AND DEPICTED LYING IN FORMALIN SOLUTION WITH THE AID OF THE STEREOSCOPIC MICROSCOPE. COURSE AND ARRANGEMENT OF THE LENS FIBRES, FIBRÆ LENTIS.

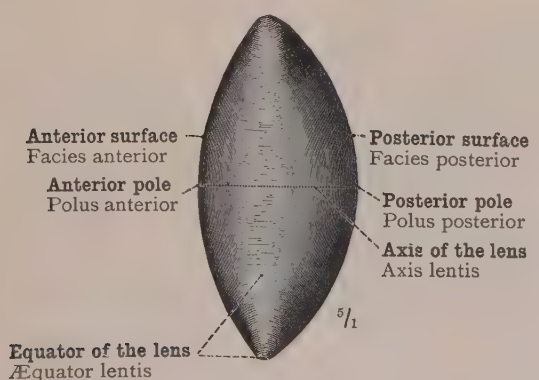


FIG. 1363.—THE TERMS USED IN THE ORIENTATION OF THE LENS.

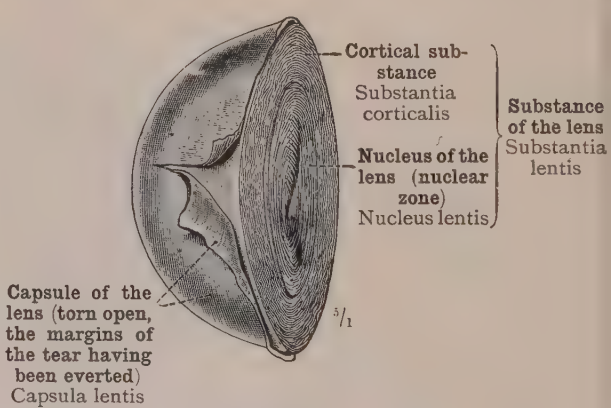


FIG. 1364.—HALF OF THE LENS WITH THE CAPSULE OF THE LENS PARTIALLY PEELED OFF.

The fresh lens was hemisected, and was drawn after it had been allowed to lie in water for twenty-four hours.

[1] See note [1] to p. 892.

Corpus vitreum—The vitreous body.—Lens crystallina—The lens.

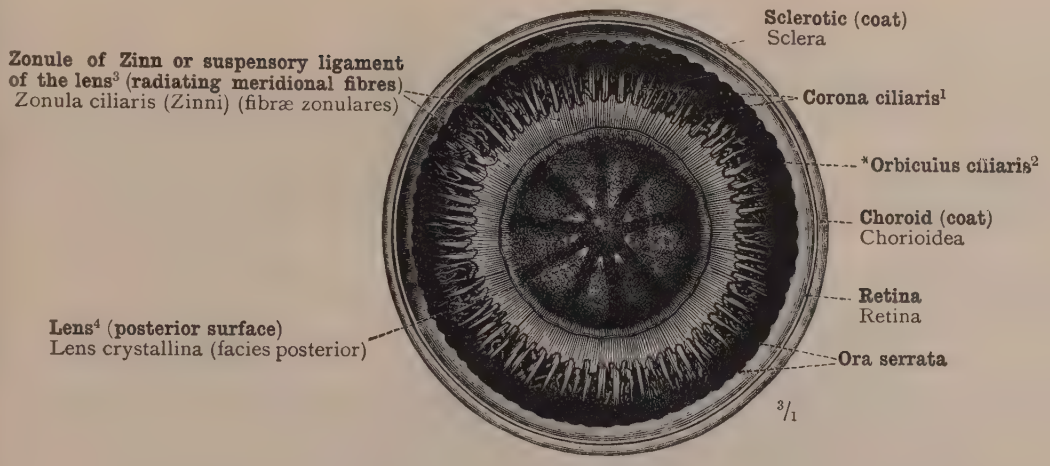


FIG. 1365.—THE ZONULE OF ZINN OR SUSPENSORY LIGAMENT OF THE LENS, ZONULA CILIARIS ZINNI (*see Appendix, note* [480]), VIEWED FROM BEHIND, IN CONNEXION WITH THE LENS AND THE CILIARY BODY.

IN AN EYEBALL REMOVED FROM THE BODY WITHIN A FEW HOURS AFTER DEATH, THE CORNEA WAS EXCISED, THE IRIS COMPLETELY REMOVED, AND THE EYEBALL WAS THEN CUT IN TWO A LITTLE IN FRONT OF THE EQUATOR. THE ZONULE OF ZINN OR SUSPENSORY LIGAMENT OF THE LENS, ZONULA CILIARIS ZINNI (*see Appendix, note* [480]), WAS NOW VISIBLE IN THE ANTERIOR SEGMENT OF THE EYE, COVERED ONLY BY THE PERFECTLY TRANSPARENT VITREOUS SUBSTANCE. THE PREPARATION WAS THEN IMMERSED IN 3 PER CENT. FORMALIN SOLUTION, AND WAS DRAWN IMMEDIATELY WITH THE AID OF THE STEREOSCOPIC MICROSCOPE, THE ILLUMINATION BEING PARTLY BY DIRECT, PARTLY BY TRANSMITTED LIGHT.

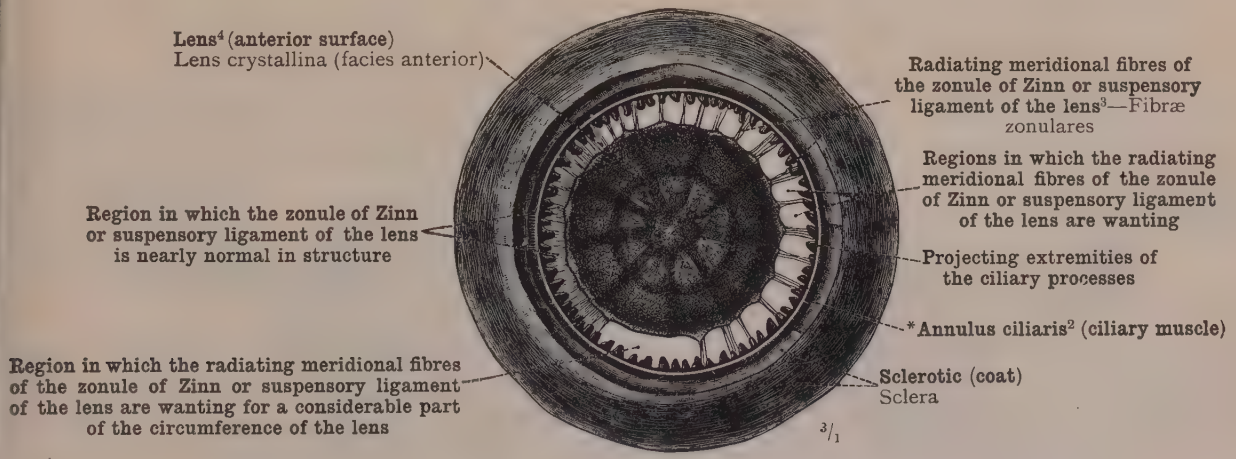

Lens[4] (anterior surface)
Lens crystallina (facies anterior)
Radiating meridional fibres of the zonule of Zinn or suspensory ligament of the lens[3]—Fibræ zonulares
Regions in which the radiating meridional fibres of the zonule of Zinn or suspensory ligament of the lens are wanting
Region in which the zonule of Zinn or suspensory ligament of the lens is nearly normal in structure
Projecting extremities of the ciliary processes
*Annulus ciliaris[2] (ciliary muscle)
Region in which the radiating meridional fibres of the zonule of Zinn or suspensory ligament of the lens are wanting for a considerable part of the circumference of the lens
Sclerotic (coat)
Sclera
3/1

FIG. 1366.—A CASE OF INCOMPLETE DEVELOPMENT OF THE ZONULE OF ZINN OR SUSPENSORY LIGAMENT OF THE LENS, ZONULA CILIARIS ZINNI (*see Appendix, note* [480]), INTRODUCED TO SHOW THE NATURE OF THE TRACTION WHICH IS EXERCISED BY THE ZONULE ON THE LENS. SEEN FROM BEFORE.

THE LENS IS SEEN TO BE DRAWN AS A WHOLE TOWARDS THAT SIDE ON WHICH A PORTION OF THE ZONULE IS ALMOST FULLY DEVELOPED. IN THOSE REGIONS IN WHICH THE RADIATING MERIDIONAL FIBRES OF THE ZONULE (FIBRÆ ZONULARES) ARE DEVELOPED IN ISOLATED SLENDER BUNDLES ONLY, THE MARGIN OF THE LENS IS NOTABLY DRAWN OUTWARDS AT THE POINTS WHERE THESE BUNDLES ARE INSERTED. GENERALLY SPEAKING, ALL ALONG THE EQUATOR OF THE LENS THE CAPSULE IS SEEN TO BE DRAWN A LITTLE AWAY FROM THE SUBSTANCE OF THE LENS.

The specimen was freshly prepared in the same manner as described at the foot of Fig. 1365.

1 See Appendix, note [485]. 2 See Appendix, note [482]. 3 See Appendix, note [480]. 4 See note 1 to p. 892.

Zonula ciliaris (Zinni)—The zonule of Zinn or suspensory ligament of the lens.

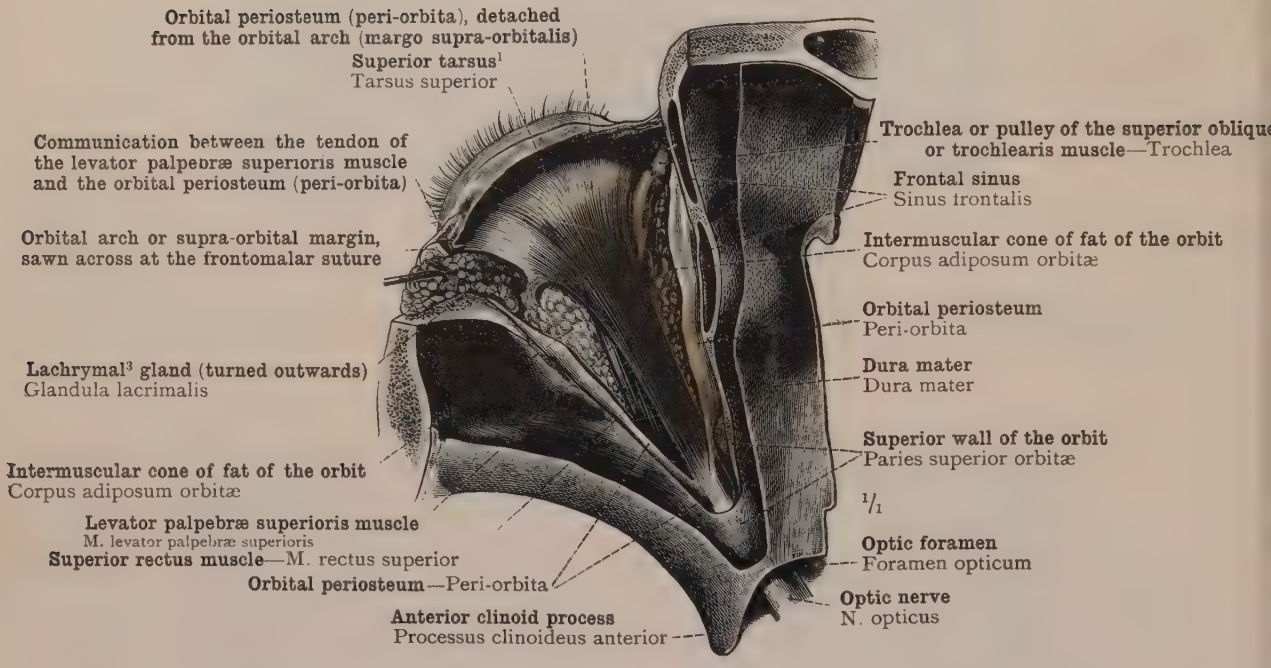

Orbital periosteum (peri-orbita), detached from the orbital arch (margo supra-orbitalis)
Superior tarsus[1]
Tarsus superior
Communication between the tendon of the levator palpebræ superioris muscle and the orbital periosteum (peri-orbita)
Orbital arch or supra-orbital margin, sawn across at the frontomalar suture
Lachrymal[3] gland (turned outwards)
Glandula lacrimalis
Intermuscular cone of fat of the orbit
Corpus adiposum orbitæ
Levator palpebræ superioris muscle
M. levator palpebræ superioris
Superior rectus muscle—M. rectus superior
Orbital periosteum—Peri-orbita
Anterior clinoid process
Processus clinoideus anterior
Trochlea or pulley of the superior oblique or trochlearis muscle—Trochlea
Frontal sinus
Sinus frontalis
Intermuscular cone of fat of the orbit
Corpus adiposum orbitæ
Orbital periosteum
Peri-orbita
Dura mater
Dura mater
Superior wall of the orbit
Paries superior orbitæ
1/1
Optic foramen
Foramen opticum
Optic nerve
N. opticus

FIG. 1367.—THE LEVATOR PALPEBRÆ SUPERIORIS MUSCLE, SEEN FROM ABOVE.

Displayed by cutting away the upper wall of the left orbit and the partial removal of the orbital periosteum (peri-orbita). The lachrymal gland has been drawn outwards.

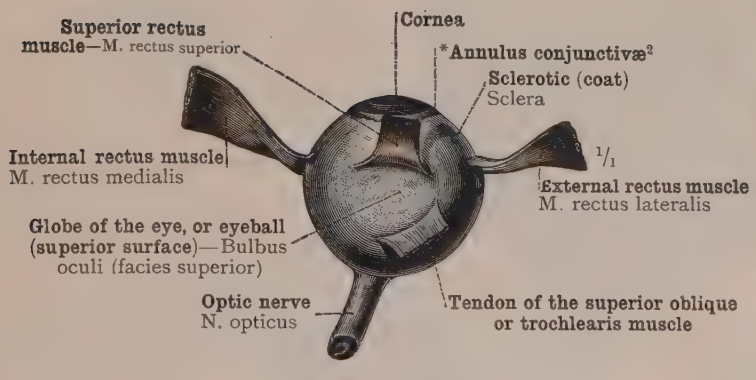


FIG. 1368.—THE INSERTIONS OF THE SUPERIOR, EXTERNAL, AND INTERNAL RECTUS MUSCLES INTO THE EYEBALL; ALSO THAT OF THE SUPERIOR OBLIQUE OR TROCHLEARIS MUSCLE. RIGHT EYE. SEEN FROM ABOVE.

The extremities of the muscles have been raised from the eyeball and inverted.

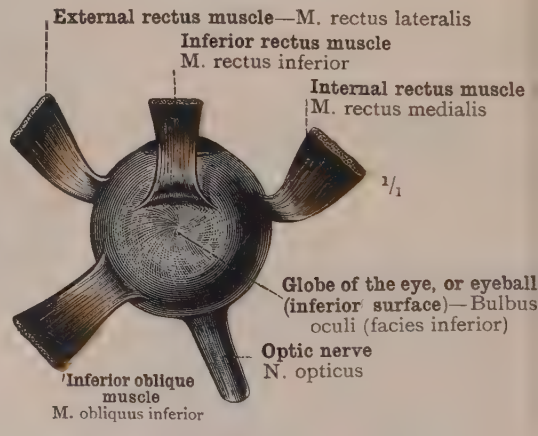


FIG. 1369.—THE INSERTIONS INTO THE EYEBALL OF THE INFERIOR, INTERNAL, AND EXTERNAL RECTUS MUSCLES; ALSO THAT OF THE INFERIOR OBLIQUE MUSCLE. RIGHT EYE. SEEN FROM BELOW.

The extremities of the muscles have been raised from the eyeball and inverted.

[1] See Appendix, note 492. [2] See Appendix, note 493.
[3] The spelling *lacrimal*, etymologically more correct than *lachrymal*, is used by some English writers. The form *lachrymal* is, however, in far more general use.

Musculi oculi—The muscles of the eyeball.

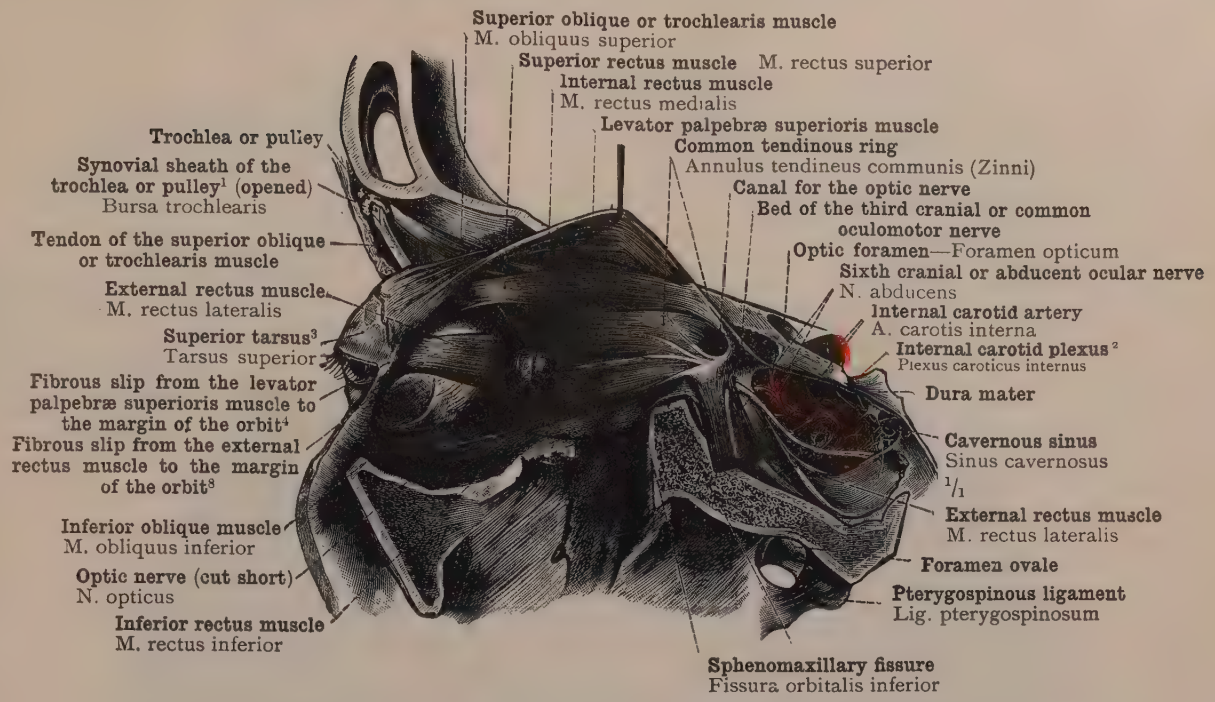


FIG. 1370.—THE MUSCLES OF THE ORBIT FROM THE TEMPORAL SIDE. LEFT EYE.

After the superior and external walls of the orbit had been removed, the external rectus muscle was cut across, its posterior segment was turned downwards, and the optic nerve was excised.

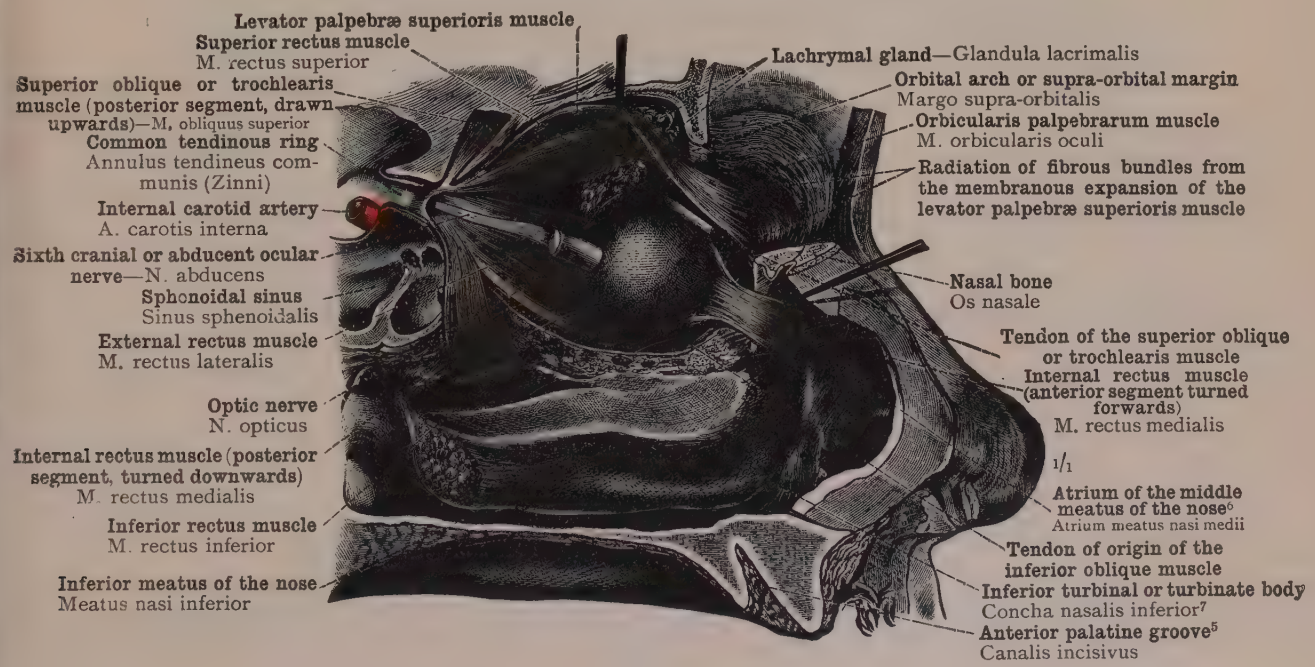

Levator palpebræ superioris muscle
Superior rectus muscle
M. rectus superior
Superior oblique or trochlearis muscle (posterior segment, drawn upwards)—M. obliquus superior
Common tendinous ring
Annulus tendineus communis (Zinni)
Internal carotid artery
A. carotis interna
Sixth cranial or abducent ocular nerve—N. abducens
Sphenoidal sinus
Sinus sphenoidalis
External rectus muscle
M. rectus lateralis
Optic nerve
N. opticus
Internal rectus muscle (posterior segment, turned downwards)
M. rectus medialis
Inferior rectus muscle
M. rectus inferior
Inferior meatus of the nose
Meatus nasi inferior
Lachrymal gland—Glandula lacrimalis
Orbital arch or supra-orbital margin
Margo supra-orbitalis
Orbicularis palpebrarum muscle
M. orbicularis oculi
Radiation of fibrous bundles from the membranous expansion of the levator palpebræ superioris muscle
Nasal bone
Os nasale
Tendon of the superior oblique or trochlearis muscle
Internal rectus muscle (anterior segment turned forwards)
M. rectus medialis
1/1
Atrium of the middle meatus of the nose[6]
Atrium meatus nasi medii
Tendon of origin of the inferior oblique muscle
Inferior turbinal or turbinate body
Concha nasalis inferior[7]
Anterior palatine groove[5]
Canalis incisivus

FIG. 1371.—THE MUSCLES OF THE ORBIT FROM THE NASAL SIDE. LEFT EYE.

After the internal and part of the superior walls of the orbit had been removed, the internal rectus muscle was cut across, its anterior segment being turned forwards, its posterior segment downwards, and the optic nerve was excised. Of the superior oblique or trochlearis muscle, the posterior extremity and a portion of the tendon of insertion were retained; the inferior oblique muscle was cut across near its origin.

1 See Appendix, note 494. 2 See note 3 to p. 859. 3 See Appendix, note 492. 4 See Appendix, note 495. 5 See Appendix, note 451.
6 By Macalister called the *region of the atrium.* 7 See note 1 to p. 944. 8 Or *outer check ligament*, see Appendix, note 495.

Musculi oculi—The muscles of the eyeball.

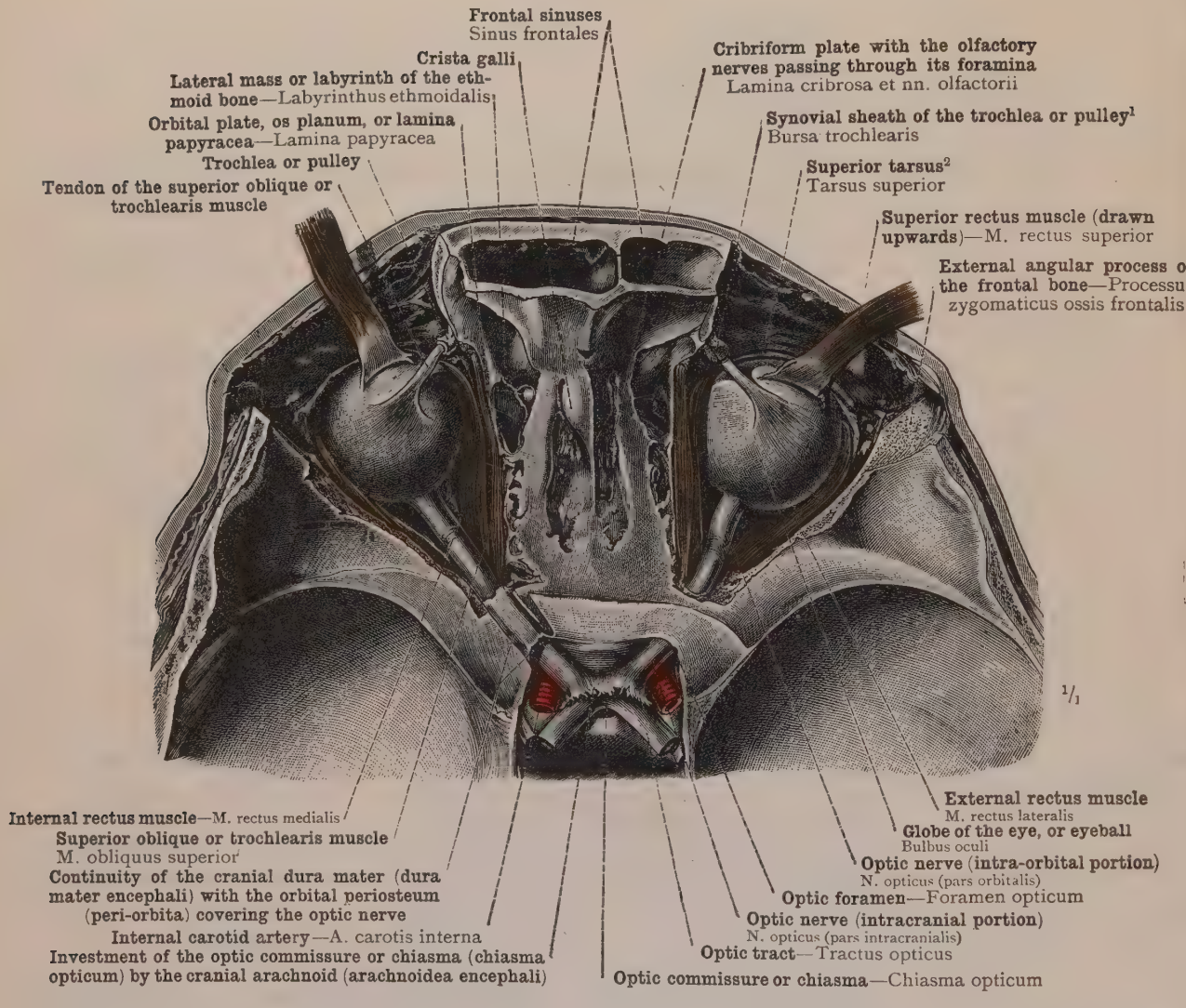

Frontal sinuses
Sinus frontales
Crista galli
Lateral mass or labyrinth of the ethmoid bone—Labyrinthus ethmoidalis
Orbital plate, os planum, or lamina papyracea—Lamina papyracea
Trochlea or pulley
Tendon of the superior oblique or trochlearis muscle
Cribriform plate with the olfactory nerves passing through its foramina
Lamina cribrosa et nn. olfactorii
Synovial sheath of the trochlea or pulley[1]
Bursa trochlearis
Superior tarsus[2]
Tarsus superior
Superior rectus muscle (drawn upwards)—M. rectus superior
External angular process of the frontal bone—Processus zygomaticus ossis frontalis
1/1
Internal rectus muscle—M. rectus medialis
Superior oblique or trochlearis muscle
M. obliquus superior
Continuity of the cranial dura mater (dura mater encephali) with the orbital periosteum (peri-orbita) covering the optic nerve
Internal carotid artery—A. carotis interna
Investment of the optic commissure or chiasma (chiasma opticum) by the cranial arachnoid (arachnoidea encephali)
External rectus muscle
M. rectus lateralis
Globe of the eye, or eyeball
Bulbus oculi
Optic nerve (intra-orbital portion)
N. opticus (pars orbitalis)
Optic foramen—Foramen opticum
Optic nerve (intracranial portion)
N. opticus (pars intracranialis)
Optic tract—Tractus opticus
Optic commissure or chiasma—Chiasma opticum

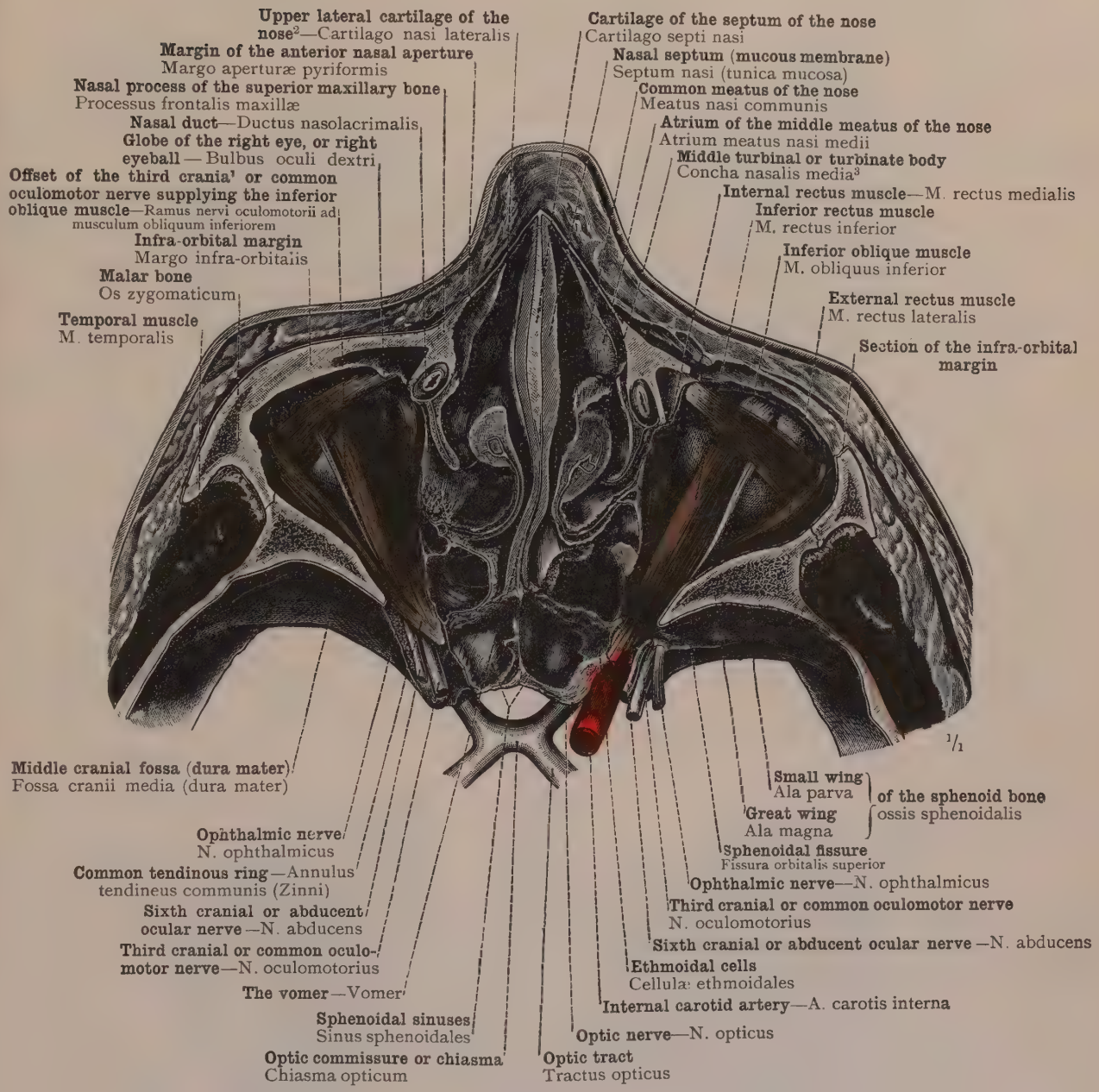
FIG. 1372.—THE POSITION OF THE EYEBALL AND THE OPTIC NERVE IN THE ORBIT, AND THE RELATIONS OF THE MUSCLES OF THE ORBIT TO THESE STRUCTURES. SEEN FROM ABOVE. THE MUTUAL RELATIONS OF THE POSTERIOR (INTRACRANIAL) PORTION OF THE OPTIC NERVE AND THE INTERNAL CAROTID ARTERY, AND THE POSITION OF THE OPTIC COMMISSURE OR CHIASMA, CHIASMA OPTICUM, IN RELATION TO THE PITUITARY FOSSA, FOSSA HYPOPHYSEOS, AND TO THE *LIMBUS SPHENOIDALIS.[3]

The superior and part of the external walls of the orbits having been cut away, the levator palpebræ superioris muscles were entirely removed, and the rectus superior muscles were detached from their origins and turned forwards. On the left side the optic foramen was opened from above, in order to show the connexion between the cranial dura mater and the orbital periosteum (peri-orbita).

[1] See Appendix, note 494. [2] See Appendix, note 492.

[3] **Limbus Sphenoidalis* —This name is given by Von Langer and Toldt to the slight ridge which connects the anterior margins of the optic foramina, and forms the anterior boundary of the optic groove in which the optic commissure lies. It is the boundary also between the middle portions of the anterior and middle cranial fossæ. It is left unnamed by Quain, nor is it indicated by name in the osteological section of this Atlas.

Musculi oculi—The muscles of the orbit.



1 By Macalister called the *region of the atrium.*
2 The *upper lateral cartilages* are by Macalister called the *lateral expansions of the septal cartilage.*
3 See note [1] to p. 944.

FIG. 1373.—THE POSITION OF THE EYEBALL IN THE ORBIT, AND THE RELATIONS OF THE MUSCLES OF THE ORBIT TO THE EYEBALL. SEEN FROM BELOW.

In the facial portion of a head previously hardened in chromic acid and alcohol, a horizontal section was carried backwards beneath the infra-orbital margins through the body of the sphenoid bone and the inner portions of the sphenoidal fissures. In the upper segment, by the removal of the orbital cone of fat, the orbital muscles accessible from below have been displayed. On the left side the infra-orbital margin has been completely removed.

Musculi oculi—Muscles of the orbit.

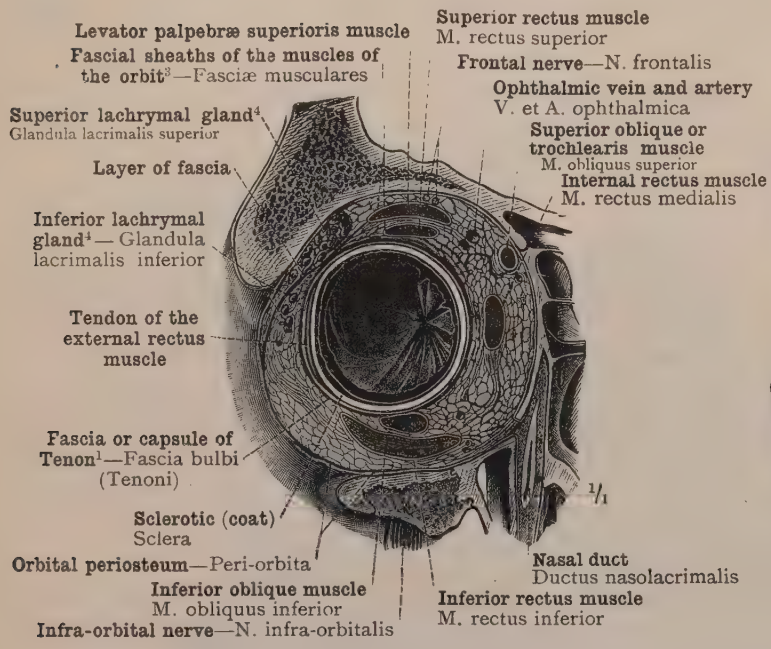


FIG. 1374.—THE POSITION OF THE EYEBALL AND OF THE MUSCLES OF THE ORBIT, AS SEEN IN A CORONAL SECTION THROUGH THE RIGHT ORBIT OF A HEAD FIRST HARDENED IN CHROMIC ACID AND ALCOHOL, AND SUBSEQUENTLY DECALCIFIED IN HYDROCHLORIC ACID.

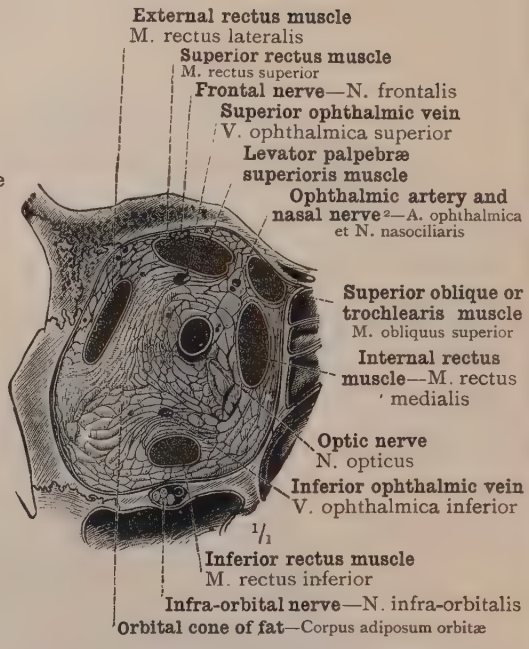


FIG. 1375.—THE POSITION OF THE OPTIC NERVE AND OF THE MUSCLES OF THE ORBIT, AS SEEN IN A CORONAL SECTION THROUGH THE RIGHT ORBIT OF A HEAD FIRST HARDENED IN CHROMIC ACID AND ALCOHOL, AND SUBSEQUENTLY DECALCIFIED IN HYDROCHLORIC ACID.

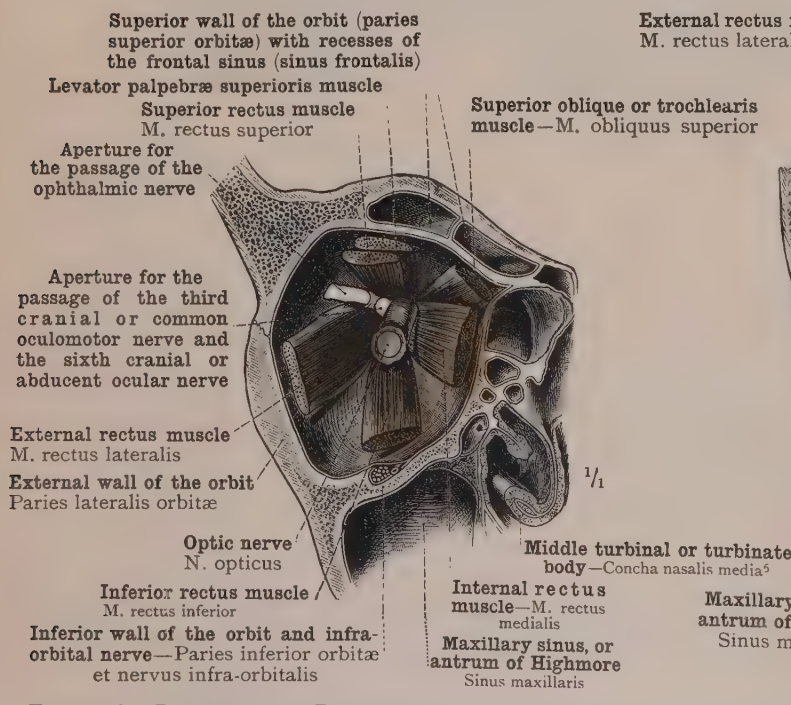

Superior wall of the orbit (paries superior orbitæ) with recesses of the frontal sinus (sinus frontalis)
Levator palpebræ superioris muscle
Superior rectus muscle
M. rectus superior
Aperture for the passage of the ophthalmic nerve
Aperture for the passage of the third cranial or common oculomotor nerve and the sixth cranial or abducent ocular nerve
External rectus muscle
M. rectus lateralis
External wall of the orbit
Paries lateralis orbitæ
Optic nerve
N. opticus
Inferior rectus muscle
M. rectus inferior
Inferior wall of the orbit and infra-orbital nerve—Paries inferior orbitæ et nervus infra-orbitalis
Superior oblique or trochlearis muscle—M. obliquus superior
1/1
Middle turbinal or turbinate body—Concha nasalis media[5]
Internal rectus muscle—M. rectus medialis
Maxillary sinus, or antrum of Highmore
Sinus maxillaris

FIG. 1376.—POSITION AND DIRECTION OF THE MUSCLES OF THE ORBIT IN RELATION TO THE OPTIC NERVE, AS SEEN IN THE POSTERIOR SEGMENT OF A CORONALLY DIVIDED RIGHT ORBIT. THE HEAD WAS PREVIOUSLY HARDENED IN CHROMIC ACID AND ALCOHOL.

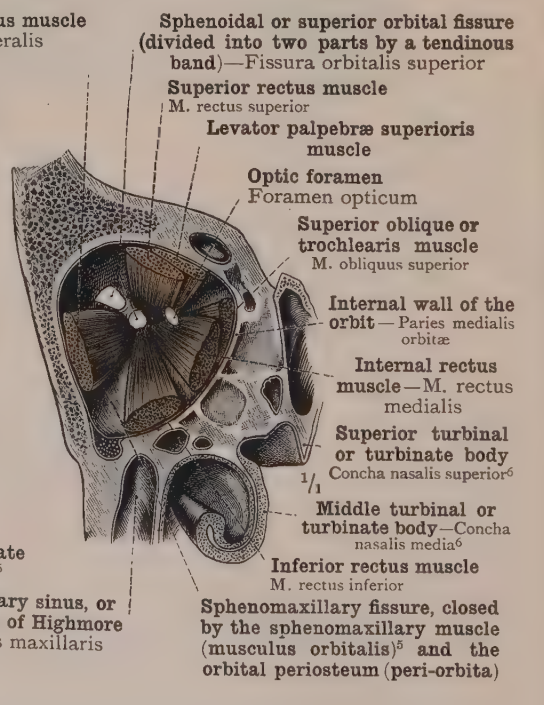

External rectus muscle
M. rectus lateralis
Sphenoidal or superior orbital fissure (divided into two parts by a tendinous band)—Fissura orbitalis superior
Superior rectus muscle
M. rectus superior
Levator palpebræ superioris muscle
Optic foramen
Foramen opticum
Superior oblique or trochlearis muscle
M. obliquus superior
Internal wall of the orbit—Paries medialis orbitæ
Internal rectus muscle—M. rectus medialis
Superior turbinal or turbinate body
Concha nasalis superior[6]
1/1
Middle turbinal or turbinate body—Concha nasalis media[6]
Inferior rectus muscle
M. rectus inferior
Maxillary sinus, or antrum of Highmore
Sinus maxillaris
Sphenomaxillary fissure, closed by the sphenomaxillary muscle (musculus orbitalis)[5] and the orbital periosteum (peri-orbita)

FIG. 1377.—POSITION OF THE MUSCLES OF THE ORBIT IN RELATION TO THE OPTIC FORAMEN AND THE SPHENOIDAL OR SUPERIOR ORBITAL FISSURE, AS SEEN IN THE POSTERIOR SEGMENT OF A CORONALLY DIVIDED RIGHT ORBIT. THE HEAD WAS PREVIOUSLY HARDENED IN CHROMIC ACID AND ALCOHOL.

[1] Sometimes called *tunica vaginalis oculi*. [2] Also known as the *oculonasal* and as the *nasociliary nerve*.
[3] See Appendix, note 495. [4] See Appendix, note 505. [5] See Appendix, note 458.

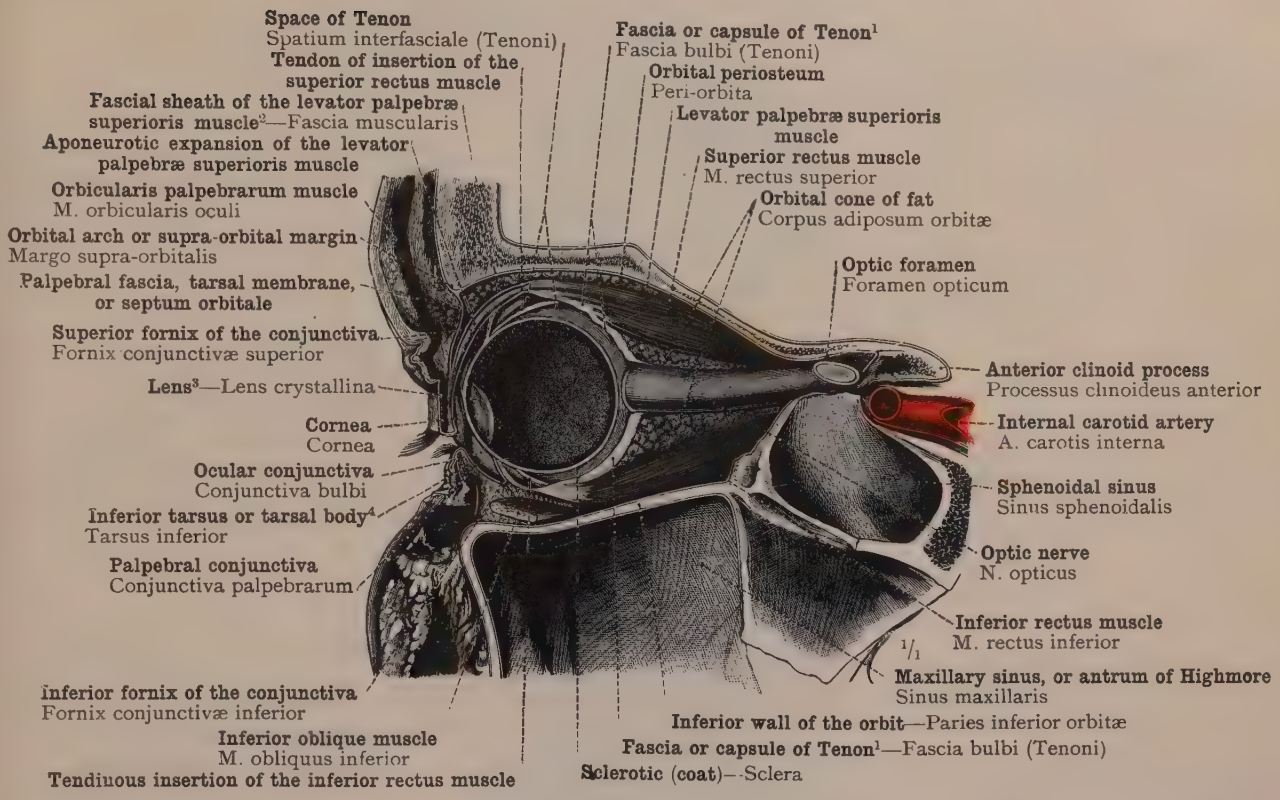


FIG. 1378.—FASCIA OR CAPSULE OF TENON,[1] FASCIA BULBI, AND ITS RELATION TO THE TENDONS OF THE SUPERIOR AND INFERIOR RECTUS MUSCLES (*see Appendix, note* 495).

The right orbit of a head previously hardened in chromic acid and alcohol was divided sagittally in such a manner that the section passed through the nasal half of the eyeball and opened the optic foramen on the nasal side of the optic nerve. The fascia or capsule of Tenon has been withdrawn a little from the surface of the eyeball.

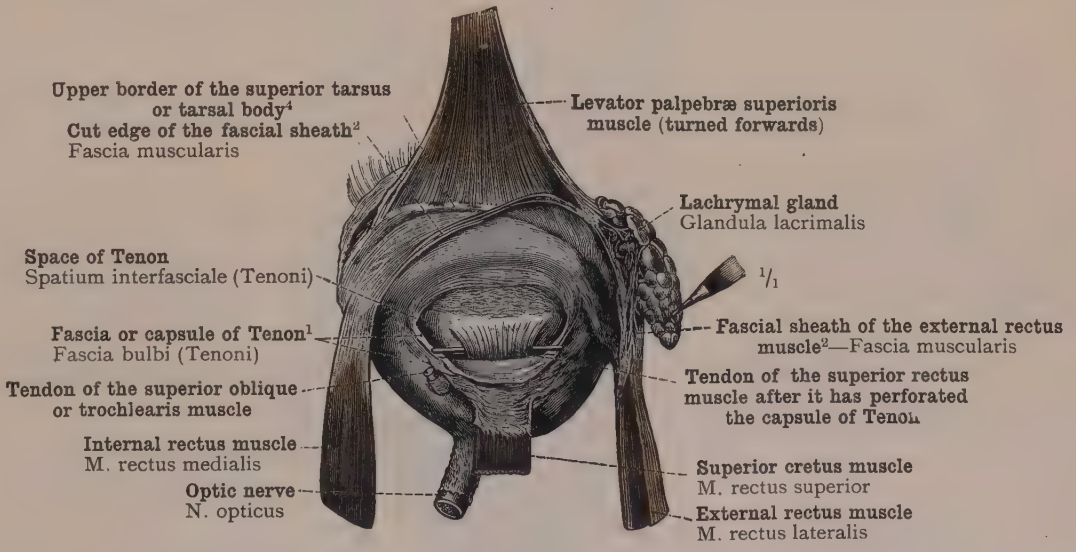

Upper border of the superior tarsus or tarsal body[4]
Cut edge of the fascial sheath[2]
Fascia muscularis
Levator palpebræ superioris muscle (turned forwards)
Lachrymal gland
Glandula lacrimalis
Space of Tenon
Spatium interfasciale (Tenoni)
1/1
Fascia or capsule of Tenon[1]
Fascia bulbi (Tenoni)
Fascial sheath of the external rectus muscle[2]—Fascia muscularis
Tendon of the superior oblique or trochlearis muscle
Tendon of the superior rectus muscle after it has perforated the capsule of Tenon
Internal rectus muscle
M. rectus medialis
Optic nerve
N. opticus
Superior cretus muscle
M. rectus superior
External rectus muscle
M. rectus lateralis

FIG. 1379.—FASCIA OR CAPSULE OF TENON, AND ITS RELATION TO THE TENDON OF THE SUPERIOR RECTUS MUSCLE, AS SEEN FROM ABOVE IN THE EXCISED RIGHT EYE.

The levator palpebræ superioris muscle has been turned forwards, and the capsule of Tenon has been opened by a transverse incision in the region of the tendon of the superior rectus muscle.

1 Sometimes called *tunica vaginalis oculi.* 2 See Appendix, note 495. 3 See note 1 to p. 892. 4 See Appendix, note 492.

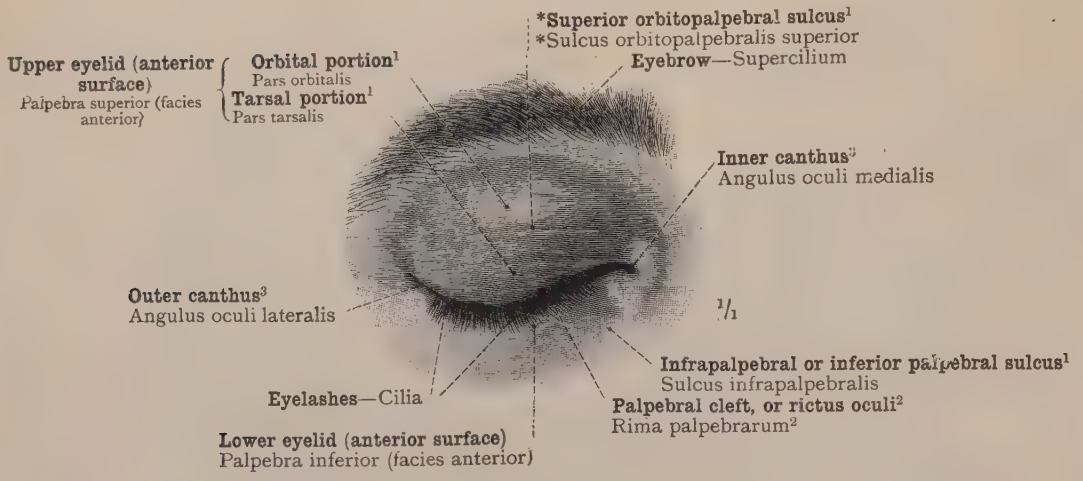
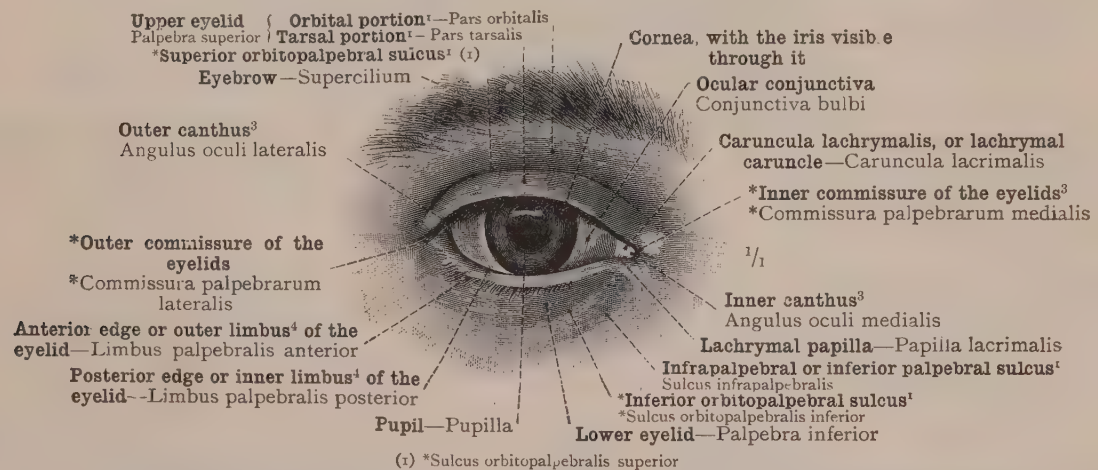


FIG. 1380.—THE CLOSED EYELIDS OF THE RIGHT EYE OF A YOUNG WOMAN, REPRODUCED FROM A LIFE-SIZED PHOTOGRAPH. ANTERIOR SURFACE OF THE EYELIDS, FACIES ANTERIOR PALPEBRARUM.



(1) *Sulcus orbitopalpebralis superior

FIG. 1381.—THE SAME EYELIDS WITH THE EYE OPEN, REPRODUCED FROM A LIFE SIZED PHOTOGRAPH. THE PALPEBRAL CLEFT, RICTUS OCULI, OR RIMA PALPEBRARUM (*see Appendix, note* 497).

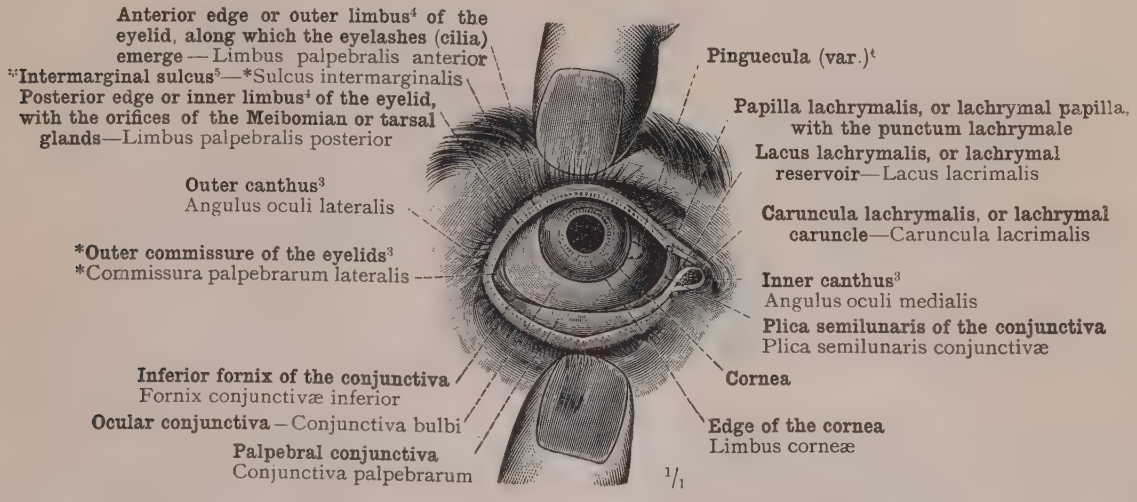

Anterior edge or outer limbus[4] of the eyelid, along which the eyelashes (cilia) emerge—Limbus palpebralis anterior
*Intermarginal sulcus[5]—*Sulcus intermarginalis
Posterior edge or inner limbus[4] of the eyelid, with the orifices of the Meibomian or tarsal glands—Limbus palpebralis posterior
Pinguecula (var.)[6]
Papilla lachrymalis, or lachrymal papilla, with the punctum lachrymale
Lacus lachrymalis, or lachrymal reservoir—Lacus lachrymalis
Outer canthus[3]
Angulus oculi lateralis
Caruncula lachrymalis, or lachrymal caruncle—Caruncula lacrimalis
*Outer commissure of the eyelids[3]
*Commissura palpebrarum lateralis
Inner canthus[3]
Angulus oculi medialis
Plica semilunaris of the conjunctiva
Plica semilunaris conjunctivæ
Cornea
Inferior fornix of the conjunctiva
Fornix conjunctivæ inferior
Ocular conjunctiva—Conjunctiva bulbi
Edge of the cornea
Limbus corneæ
Palpebral conjunctiva
Conjunctiva palpebrarum
1/1

FIG. 1382.—THE WIDELY-OPENED EYELIDS OF THE RIGHT EYE OF AN ELDERLY PERSON. THE LOWER EYELID HAS BEEN EVERTED. PINGUECULA.

[1] See Appendix, note 496. [2] See Appendix, note 497. [3] See Appendix, note 498.
[4] The term *limbus* in connexion with the eyelid is used by Macalister, but not by Quain. The former writer speaks indifferently of the *limbus anterior* or *outer limbus*, and of the *limbus posterior* or *inner limbus* (*op. cit.*, p. 522, and Fig. 712, p. 643).
[5] See Appendix, note 499. [6] See Appendix, note 500.

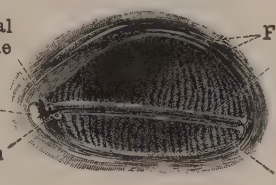

Papilla lachrymalis or lachrymal papilla, and punctum lachrymale
Papilla lacrimalis et punctum lacrimale
Caruncula lachrymalis, or lachrymal caruncle—Caruncula lacrimalis
Papilla lachrymalis or lachrymal papilla, and punctum lachrymale—Papilla lacrimalis et punctum lacrimale
Folds of the conjunctiva
Deepest fasciculi, seen through the mucous membrane, of the pars lachrymalis of the orbicularis palpebrarum muscle (ciliary bundle, subtarsalis muscle, or muscle of Riolan)[1]—M. ciliaris Riolani *vel* M. subtarsalis
1/1
***Rivus lachrymalis**[2]—*Rivus lacrimalis

FIG. 1383.—THE POSTERIOR SURFACE OF THE EXCISED EYELIDS, FACIES POSTERIOR PALPEBRARUM. IN THE REGION OF THE TARSI OR TARSAL MEMBRANES, THE MEIBOMIAN OR TARSAL GLANDS ARE VISIBLE BENEATH THE CONJUNCTIVA. RIGHT SIDE.

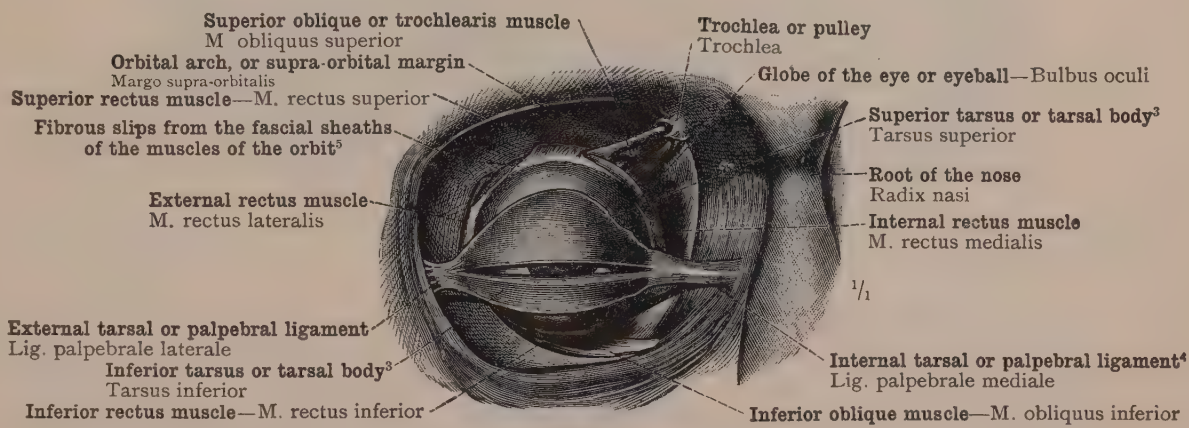


FIG. 1384.—THE SUPERIOR AND INFERIOR TARSI OR TARSAL BODIES, TARSUS SUPERIOR ET TARSUS INFERIOR (*see Appendix, note* 492), OF THE RIGHT EYE, WITH THE INTERNAL TARSAL OR PALPEBRAL LIGAMENT, LIGAMENTUM PALPEBRALE MEDIALE (*see note* 4 *below*), AND THE EXTERNAL TARSAL OR PALPEBRAL LIGAMENT, LIGAMENTUM PALPEBRALE LATERALE, ISOLATED. THEIR RELATIONS TO THE EYEBALL WHEN THE LIDS ARE CLOSED. THE ATTACHMENT OF THE RECTI MUSCLES TO THE EYEBALL, AND THE COURSE OF THE OBLIQUE MUSCLES. VIEWED FROM BEFORE.

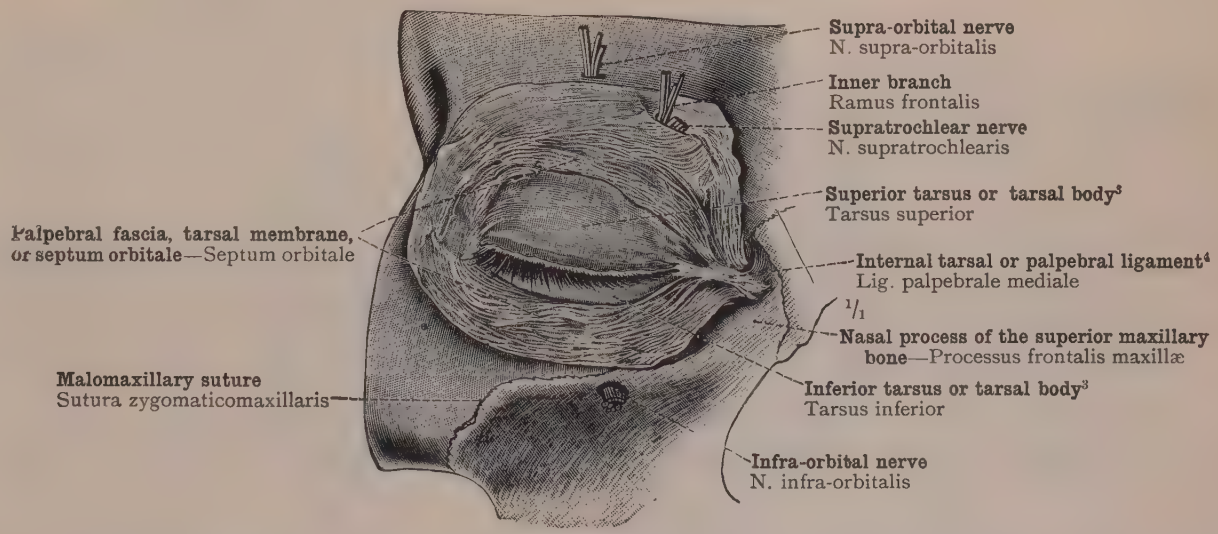


FIG. 1385.—THE PALPEBRAL FASCIA, TARSAL MEMBRANE, OR SEPTUM ORBITALE, IN CONNEXION WITH THE TARSI OR TARSAL BODIES (*see Appendix, note* 492), DISPLAYED FROM BEFORE BY THE REMOVAL OF THE SKIN AND THE ORBICULARIS PALPEBRARUM MUSCLE. RIGHT SIDE.

1 See Appendix, note 501. 2 See Appendix, note 502. 3 See Appendix, note 492.
4 Known also as the *tendon of the orbicularis muscle*, or *tendo palpebrarum*. 5 See Appendix, note 495.

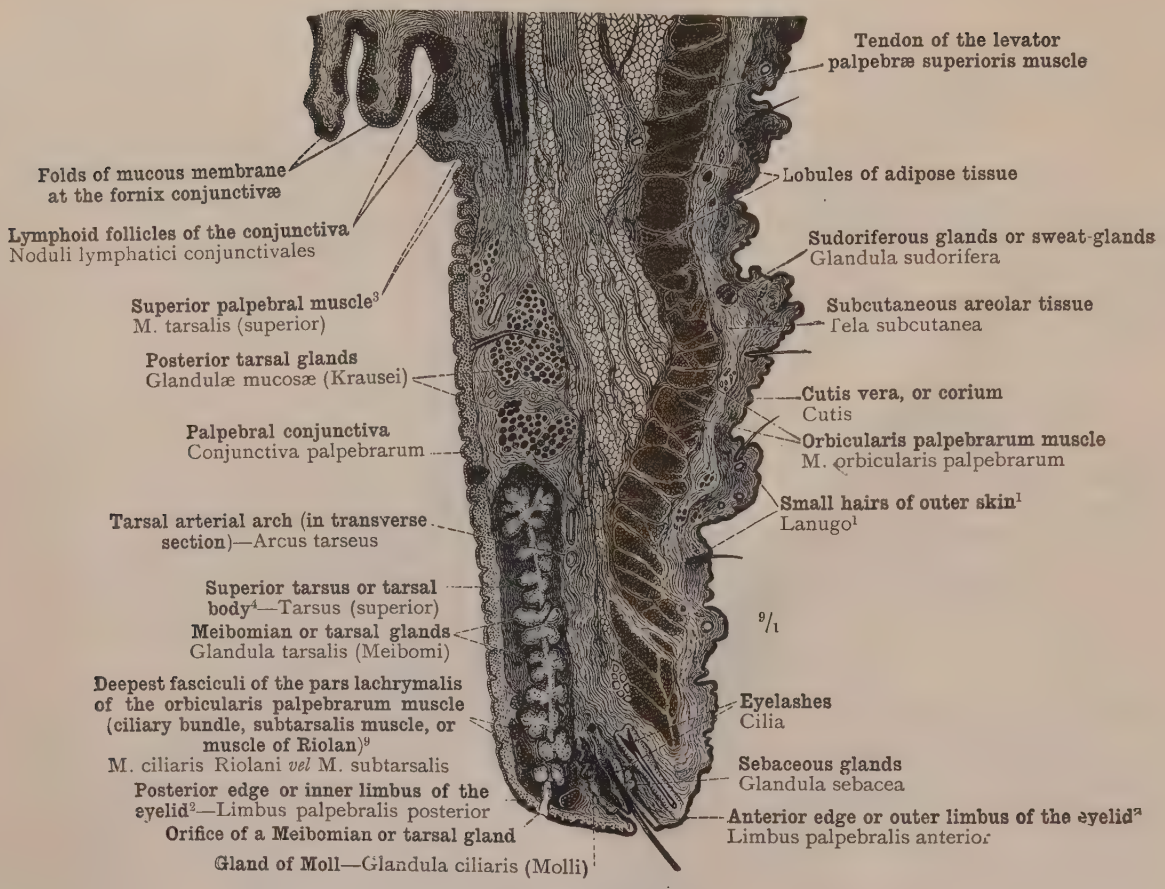

Tendon of the levator palpebræ superioris muscle
Folds of mucous membrane at the fornix conjunctivæ
Lobules of adipose tissue
Lymphoid follicles of the conjunctiva
Noduli lymphatici conjunctivales
Sudoriferous glands or sweat-glands
Glandula sudorifera
Superior palpebral muscle[3]
M. tarsalis (superior)
Subcutaneous areolar tissue
Tela subcutanea
Posterior tarsal glands
Glandulæ mucosæ (Krausei)
Cutis vera, or corium
Cutis
Palpebral conjunctiva
Conjunctiva palpebrarum
Orbicularis palpebrarum muscle
M. orbicularis palpebrarum
Small hairs of outer skin[1]
Lanugo[1]
Tarsal arterial arch (in transverse section)—Arcus tarseus
Superior tarsus or tarsal body[4]—Tarsus (superior)
9/1
Meibomian or tarsal glands
Glandula tarsalis (Meibomi)
Deepest fasciculi of the pars lachrymalis of the orbicularis palpebrarum muscle (ciliary bundle, subtarsalis muscle, or muscle of Riolan)[9]
M. ciliaris Riolani *vel* M. subtarsalis
Eyelashes
Cilia
Sebaceous glands
Glandula sebacea
Posterior edge or inner limbus of the eyelid[2]—Limbus palpebralis posterior
Anterior edge or outer limbus of the eyelid[2]
Limbus palpebralis anterior
Orifice of a Meibomian or tarsal gland
Gland of Moll—Glandula ciliaris (Molli)

FIG. 1386.—THE UPPER EYELID IN SAGITTAL SECTION.

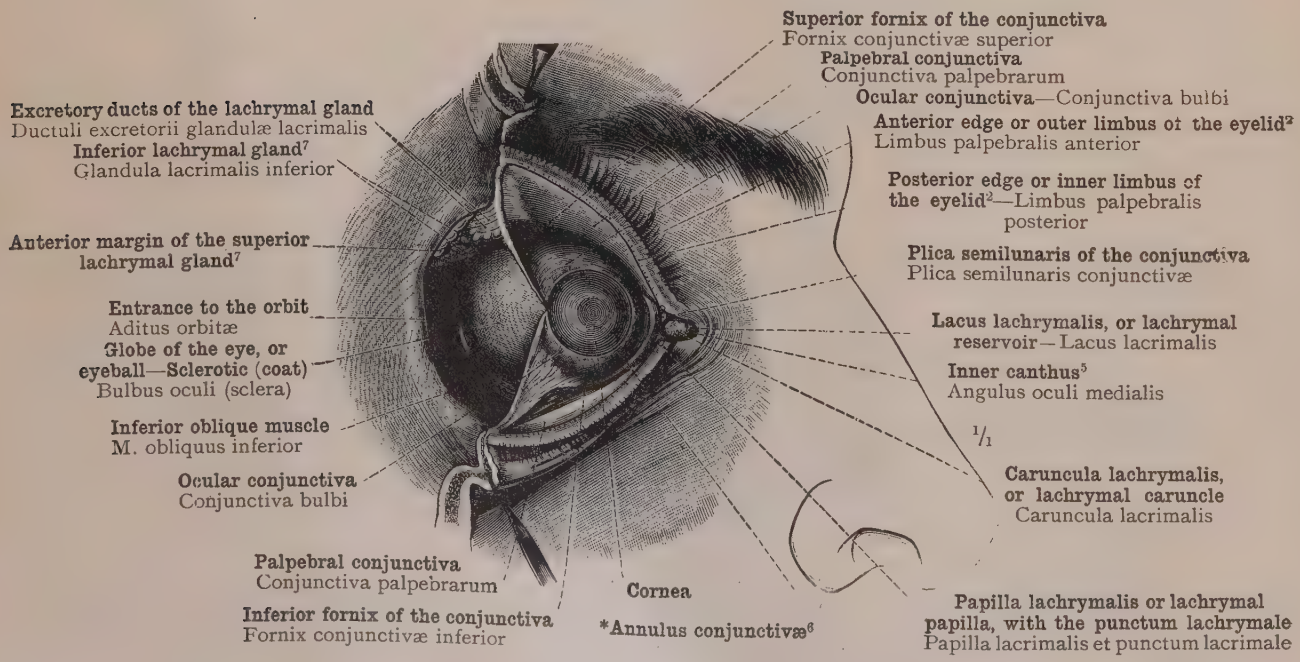


FIG. 1387.—THE CONJUNCTIVA OF THE RIGHT EYE. ITS THREE PARTS: THE PALPEBRAL CONJUNCTIVA, CONJUNCTIVA PALPEBRARUM; THE OCULAR CONJUNCTIVA, CONJUNCTIVA BULBI; AND ITS REFLECTION ALONG THE FORNICES.[8] THE EYELIDS WERE SEPARATED BY DIVISION OF THE OUTER CANTHUS (*see Appendix, note* [498]), AND A HORIZONTAL INCISION CARRIED THENCE THROUGH THE CONJUNCTIVA INWARDS TO THE MARGIN OF THE CORNEA.

1 See Appendix, note 503. 2 See note 4 to p. 908. 3 See Appendix, note 504. 4 See Appendix, note 492.
5 See Appendix, note 498. 6 See Appendix, note 493. 7 See Appendix, note 505.
8 This part of the conjunctiva is in the German original called *der Uebergangstheil*, the *transitional part*. No Latin term is used.
9 See Appendix, note 501.

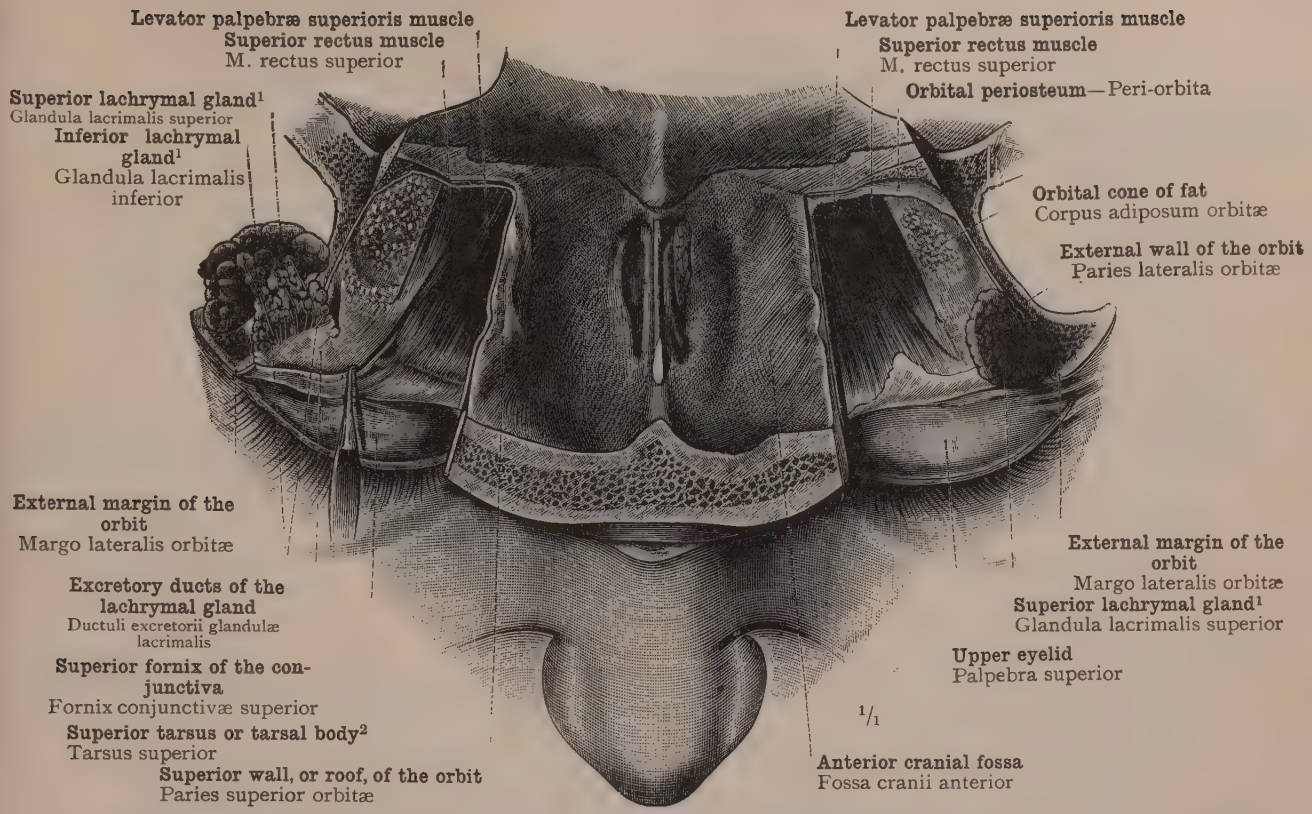


FIG. 1388.—THE LACHRYMAL GLAND, GLANDULA LACHRYMALIS (*see Appendix, note* [505]), DISPLAYED BY OPENING THE ORBIT FROM ABOVE. THE LEFT LACHRYMAL GLAND IS SEEN IN ITS NATURAL POSITION, BUT THE RIGHT GLAND, IN ORDER TO EXPOSE ITS EXCRETORY DUCTS, HAS BEEN TURNED BACKWARDS.

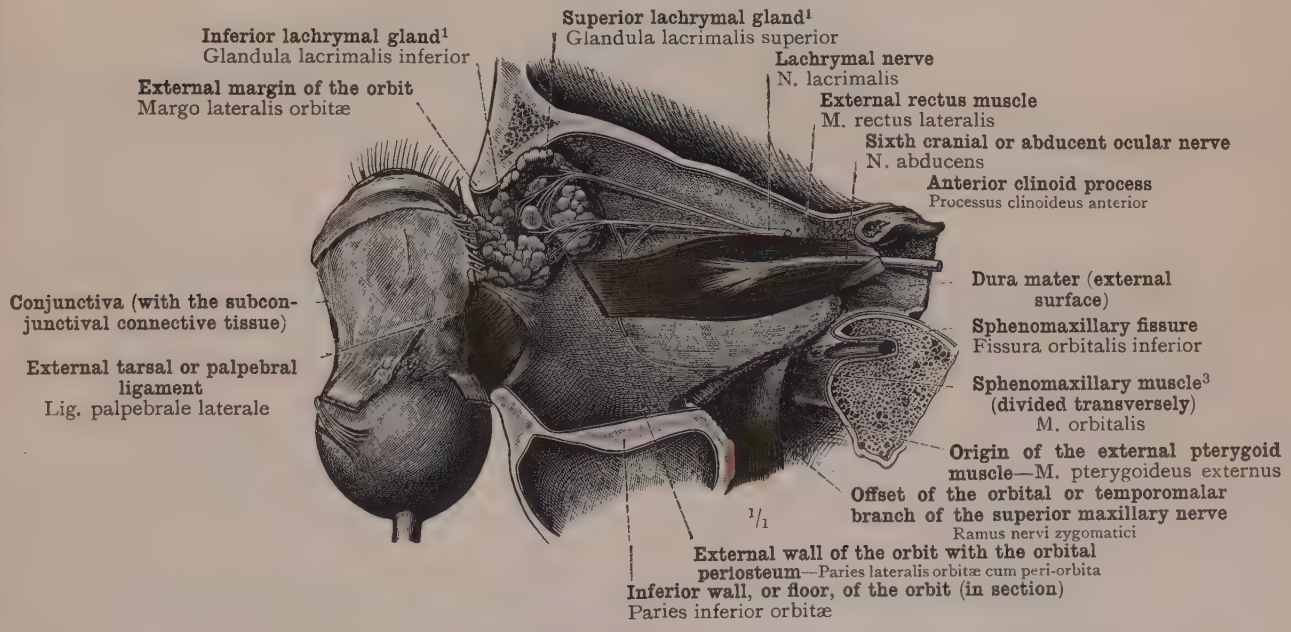

Superior lachrymal gland[1]
Glandula lacrimalis superior
Inferior lachrymal gland[1]
Glandula lacrimalis inferior
Lachrymal nerve
N. lacrimalis
External margin of the orbit
Margo lateralis orbitæ
External rectus muscle
M. rectus lateralis
Sixth cranial or abducent ocular nerve
N. abducens
Anterior clinoid process
Processus clinoideus anterior
Dura mater (external surface)
Conjunctiva (with the subconjunctival connective tissue)
Sphenomaxillary fissure
Fissura orbitalis inferior
External tarsal or palpebral ligament
Lig. palpebrale laterale
Sphenomaxillary muscle[3] (divided transversely)
M. orbitalis
Origin of the external pterygoid muscle—M. pterygoideus externus
Offset of the orbital or temporomalar branch of the superior maxillary nerve
Ramus nervi zygomatici
1/1
External wall of the orbit with the orbital periosteum—Paries lateralis orbitæ cum peri-orbita
Inferior wall, or floor, of the orbit (in section)
Paries inferior orbitæ

FIG. 1389.—THE NATURAL POSITION OF THE LACHRYMAL GLAND, IN RELATION TO THE WALL OF THE ORBIT AND TO THE EXTERNAL TARSAL OR PALPEBRAL LIGAMENT. OUTER HALF OF THE RIGHT ORBIT.

The eyeball, together with the fully-exposed conjunctiva, the folds of which have been obliterated by tension, has been withdrawn from the orbit. The excretory ducts, ductuli excretorii, of the lachrymal gland have been slightly raised by means of a probe which has been passed beneath them.

[1] See Appendix, note 505. [2] See Appendix, note 492. [3] See Appendix, note 458.

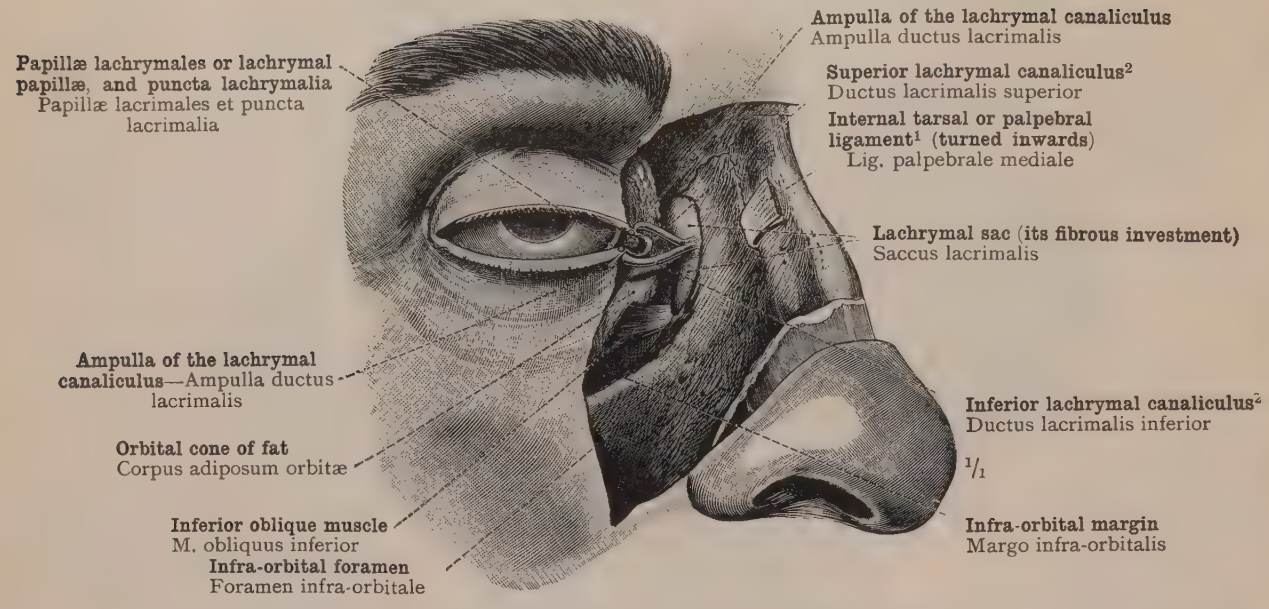


FIG. 1390.—THE LACHRYMAL SAC, SACCUS LACRIMALIS, WITH THE LACHRYMAL CANALICULI, DUCTUS LACRIMALES, DISPLAYED BY THE REMOVAL OF THE SKIN, THE INTERNAL TARSAL OR PALPEBRAL LIGAMENT[1], THE ORBICULARIS PALPEBRARUM MUSCLE, AND THE OTHER FACIAL MUSCLES IN THE NEIGHBOURHOOD. THE FIBROUS INVESTMENT OF THE LACHRYMAL SAC IS EXPOSED. RIGHT SIDE.

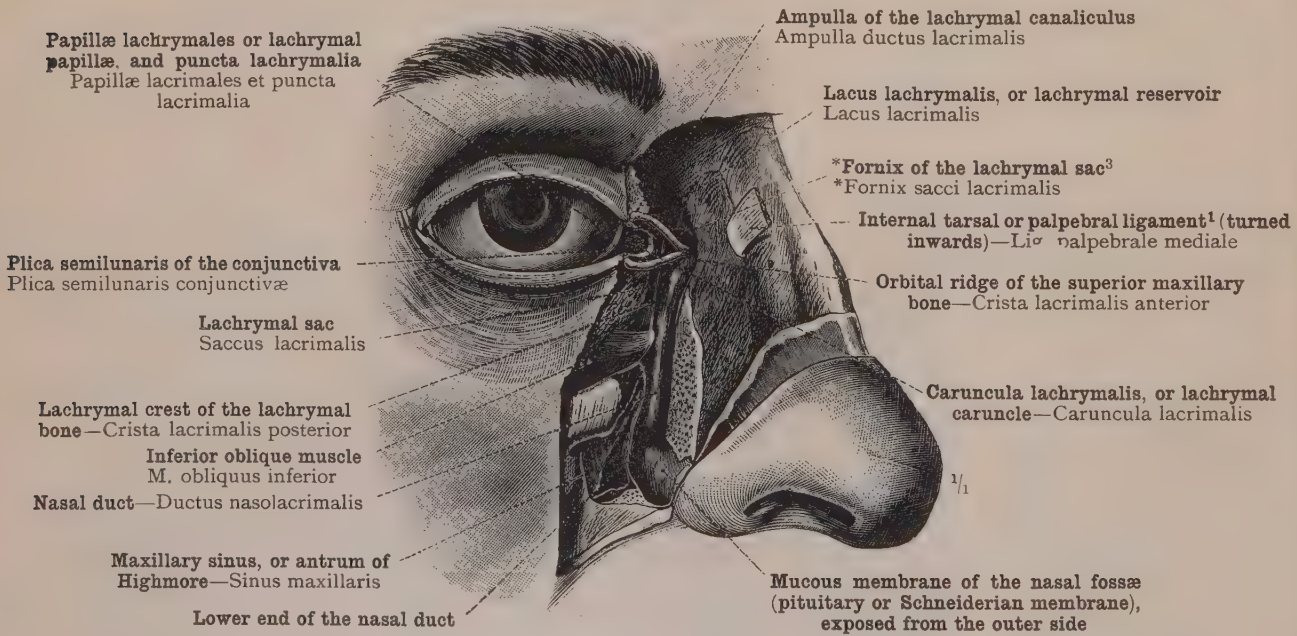

Ampulla of the lachrymal canaliculus
Ampulla ductus lacrimalis
Papillæ lachrymales or lachrymal papillæ, and puncta lachrymalia
Papillæ lacrimales et puncta lacrimalia
Lacus lachrymalis, or lachrymal reservoir
Lacus lachrymalis
*Fornix of the lachrymal sac[3]
*Fornix sacci lacrimalis
Internal tarsal or palpebral ligament[1] (turned inwards)—Lig. palpebrale mediale
Plica semilunaris of the conjunctiva
Plica semilunaris conjunctivæ
Orbital ridge of the superior maxillary bone—Crista lacrimalis anterior
Lachrymal sac
Saccus lacrimalis
Caruncula lachrymalis, or lachrymal caruncle—Caruncula lachrymalis
Lachrymal crest of the lachrymal bone—Crista lacrimalis posterior
Inferior oblique muscle
M. obliquus inferior
1/1
Nasal duct—Ductus nasolacrimalis
Maxillary sinus, or antrum of Highmore—Sinus maxillaris
Mucous membrane of the nasal fossæ (pituitary or Schneiderian membrane), exposed from the outer side
Lower end of the nasal duct

FIG. 1391.—THE LACHRYMAL SAC, SACCUS LACHRIMALIS, WITH THE LACHRYMAL CANALICULI, DUCTUS LACRIMALIS, AND THE NASAL DUCT, DUCTUS NASOLACRIMALIS, OF THE RIGHT SIDE.

In the preparation shown in Fig. 1390, the substance of the superior maxillary bone was removed from without inwards as far as the lachrymal groove, sulcus lacrimalis, and the anterior and external walls of the nasal duct, ductus nasolacrimalis, were thus exposed up to the point at which these walls become continuous with mucous membrane of the nasal fossæ. The fibrous investment of the lachrymal sac was also removed, so that the outer side of the mucous membrane, alike of the lachrymal sac and of the nasal duct, is exposed to view.

1 Known also as the *tendon of the orbicularis muscle*, or *tendo palpebrarum*.
2 *Lachrymal Canaliculi.*—Quain speaks of these as the *lachrymal canals*, but this usage is exceptional.
3 **Fornix of the Lachrymal Sac.*—The name of *fornix sacci lacrimalis* is given by Toldt to the upper blind extremity of the lachrymal sac. The term is not used by Quain or Macalister.

Apparatus lacrimalis—The lachrymal apparatus.

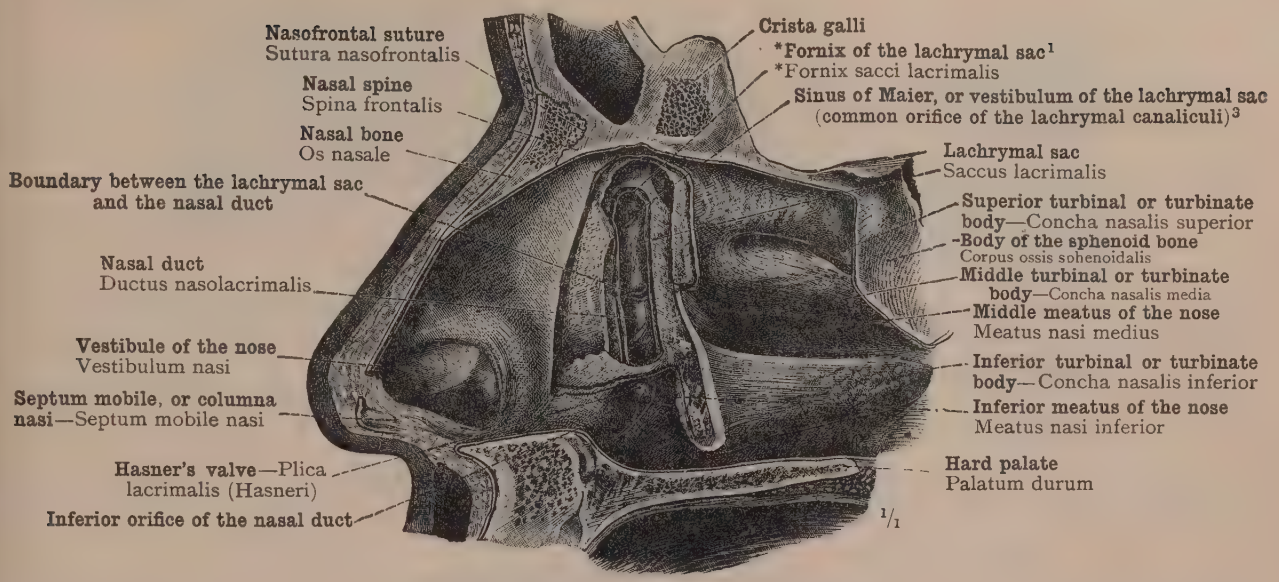

Nasofrontal suture
Sutura nasofrontalis
Nasal spine
Spina frontalis
Nasal bone
Os nasale
Boundary between the lachrymal sac and the nasal duct
Nasal duct
Ductus nasolacrimalis
Vestibule of the nose
Vestibulum nasi
Septum mobile, or columna nasi—Septum mobile nasi
Hasner's valve—Plica lacrimalis (Hasneri)
Inferior orifice of the nasal duct
Crista galli
*Fornix of the lachrymal sac[1]
*Fornix sacci lacrimalis
Sinus of Maier, or vestibulum of the lachrymal sac (common orifice of the lachrymal canaliculi)[3]
Lachrymal sac
Saccus lacrimalis
Superior turbinal or turbinate body—Concha nasalis superior
Body of the sphenoid bone
Corpus ossis sphenoidalis
Middle turbinal or turbinate body—Concha nasalis media
Middle meatus of the nose
Meatus nasi medius
Inferior turbinal or turbinate body—Concha nasalis inferior
Inferior meatus of the nose
Meatus nasi inferior
Hard palate
Palatum durum
1/1

FIG. 1392.—THE LACHRYMAL SAC, SACCUS LACRIMALIS, AND THE NASAL DUCT, DUCTUS NASOLACRIMALIS, OF THE RIGHT SIDE, DISPLAYED FROM THE INTERIOR OF THE NASAL FOSSÆ. THE INFERIOR ORIFICE OF THE NASAL DUCT, IN THE INFERIOR MEATUS OF THE NOSE; HASNER'S VALVE, PLICA LACRIMALIS (HASNERI).

In a sagitally hemisected head, after the removal of the anterior portions of the middle and inferior turbinals or turbinate bodies, as well as the surrounding portions of the nasal mucous membrane (pituitary or Schneiderian membrane), the inner bony wall of the lachrymal groove and the nasal duct was removed as far down as the attachment of the inferior turbinate bone of the nose, so as to expose the lachrymal sac and the nasal duct. These were then both opened by the removal of their inner wall.

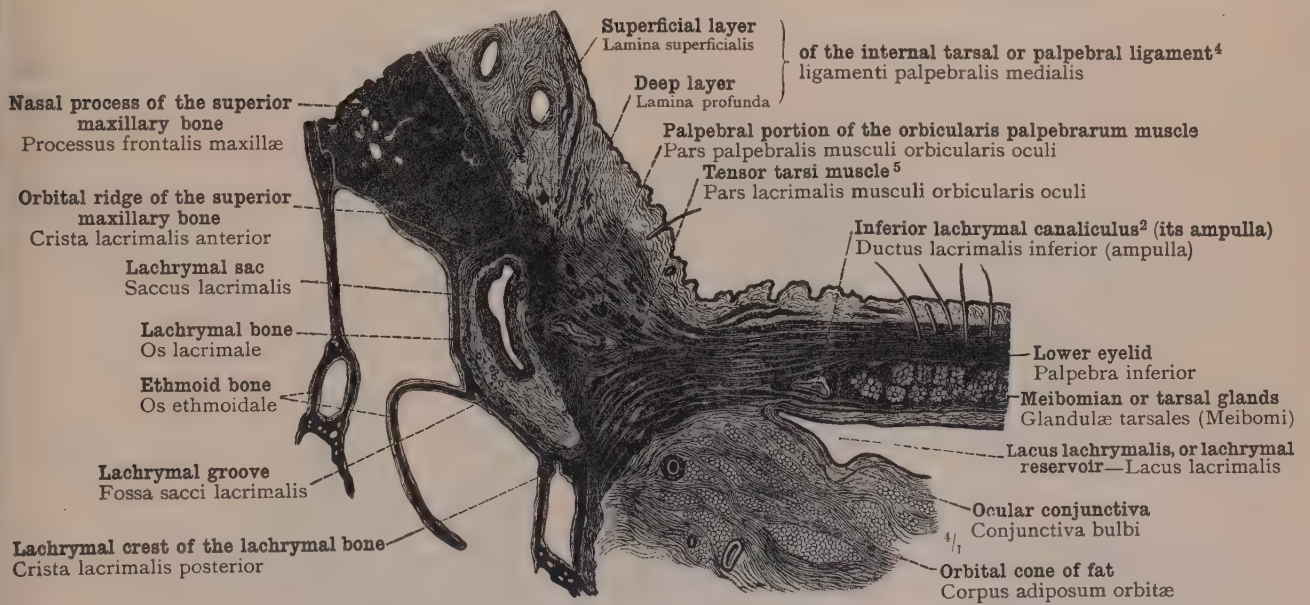


FIG. 1393.—HORIZONTAL SECTION THROUGH THE LACHRYMAL SAC AND THE MARGINAL PORTION OF THE LOWER EYELID. THE INFERIOR LACHRYMAL CANALICULUS (*see note* [2] *to p.* 912) APPEARS TWICE IN THE SECTION, AND THE SUPERIOR LACHRYMAL CANALICULUS IS CUT ACROSS QUITE NEAR TO THE LACHRYMAL SAC.

[1] See note 3 to p. 912. [2] See note 2 to p. 912. [3] See Appendix, note 506.
[4] Known also as the *tendon of the orbicularis muscle*, or *tendo palpebrarum*.
[5] Known also as *Horner's muscle* (*musculus Horneri*), and as the *musculus sacci lachrymalis*. Sometimes also in England called *pars lachrymalis musculi orbicularis palpebrarum*. See Appendix, note 501.

Apparatus lacrimalis—The lachrymal apparatus.

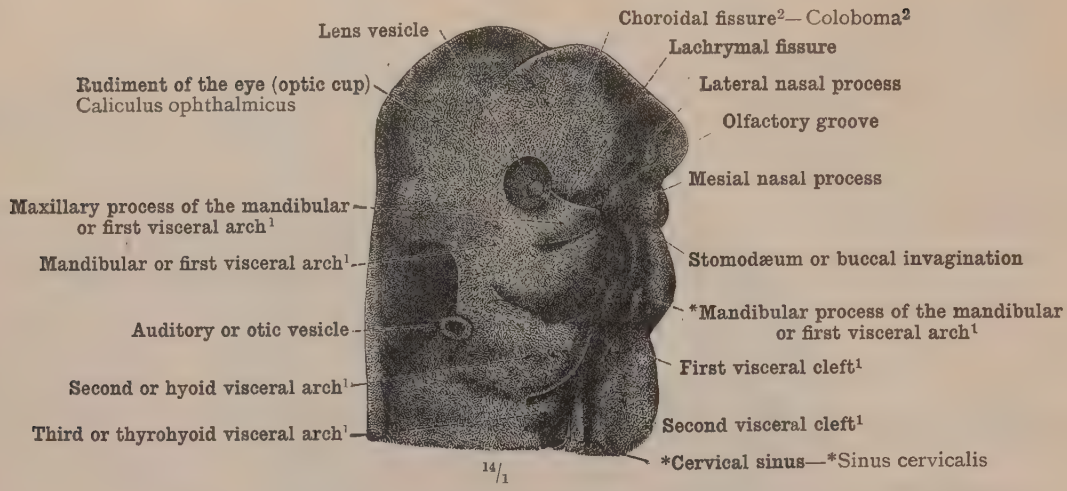


FIG. 1394.—HEAD OF A HUMAN EMBRYO AT OR NEAR THE END OF THE FOURTH WEEK OF INTRA-UTERINE LIFE. SEEN OBLIQUELY FROM BEFORE AND THE RIGHT SIDE.

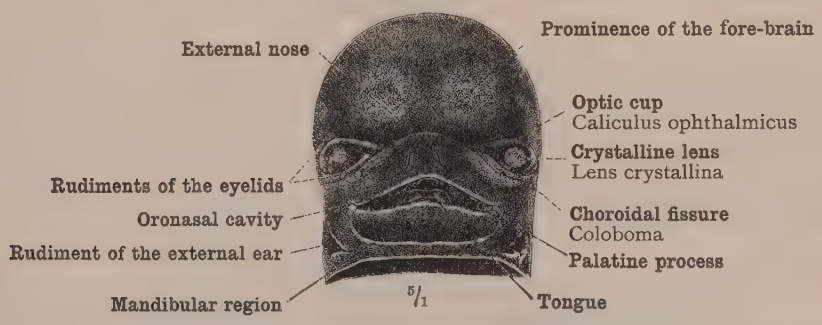


FIG. 1395.—THE HEAD OF A HUMAN EMBRYO AT THE END OF THE SIXTH WEEK OF INTRA-UTERINE LIFE. SEEN FROM BEFORE.

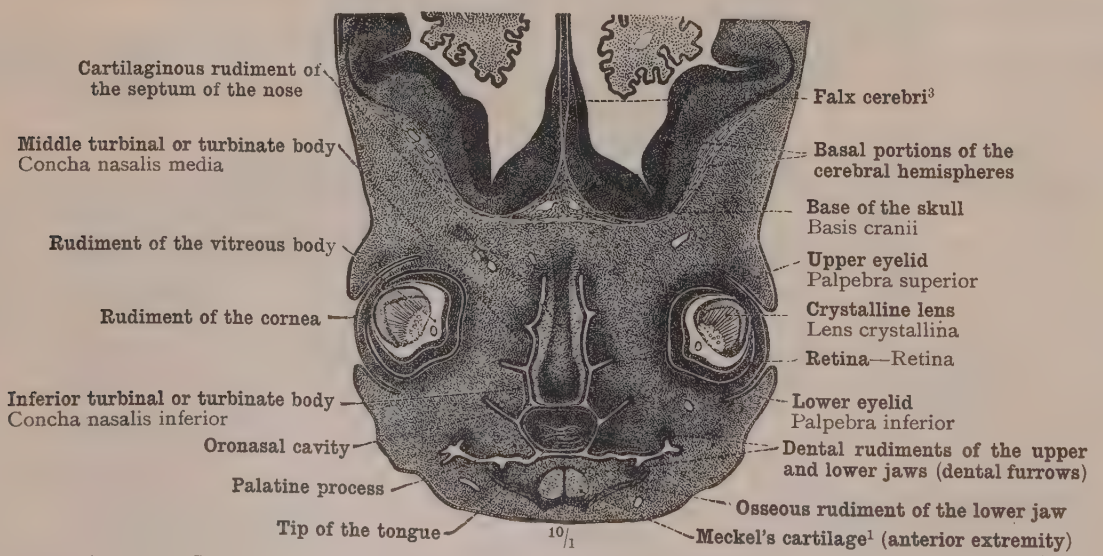


FIG. 1396.—CORONAL SECTION THROUGH THE FACE OF A HUMAN EMBRYO AT THE END OF THE EIGHTH WEEK OF INTRA-UTERINE LIFE.

[1] See Appendix, note 448. [2] See Appendix, note 507. [3] Sometimes distinguished as the *falx major*.

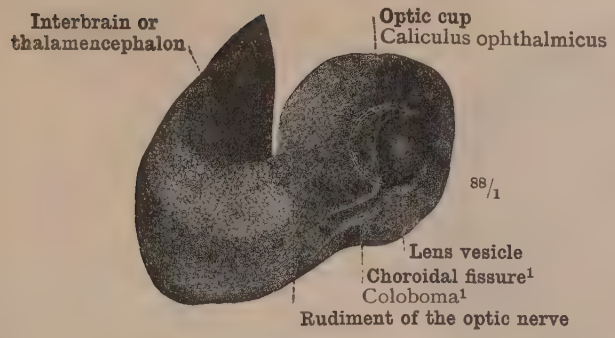


FIG. 1397.—MODEL OF THE OPTIC CUP WITH THE HOLLOW OPTIC STALK, THE LENS VESICLE, AND THE CHQROIDAL FISSURE; FROM A HUMAN EMBRYO OF TWENTY-SEVEN DAYS. (FROM FUCHS AND HOCHSTETTER'S "LEHRBUCH DER AUGENHEILKUNDE.")

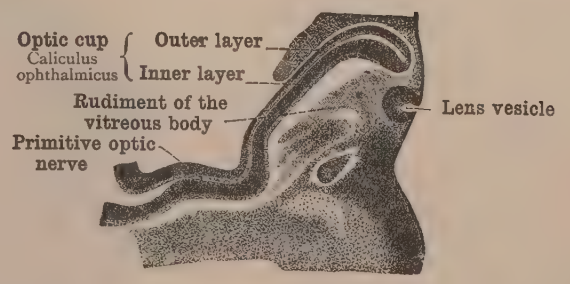


FIG. 1398.—LONGITUDINAL SECTION THROUGH THE OPTIC CUP AND THE RUDIMENT OF THE OPTIC NERVE OF THE EMBRYO DEPICTED IN FIG. 1394. THE SECTION PASSES THROUGH THE CHOROIDAL FISSURE.

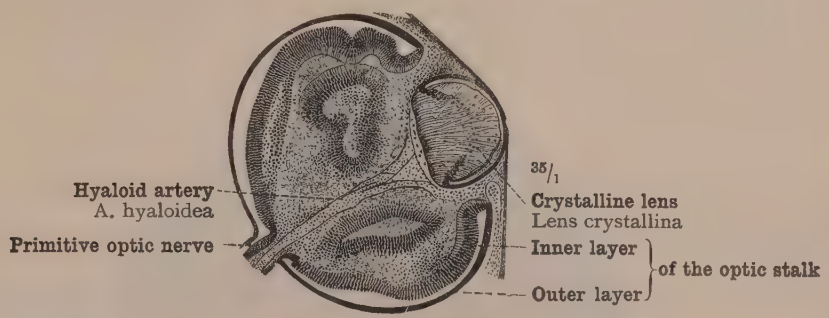


FIG. 1399.—HORIZONTAL SECTION THROUGH THE RIGHT EYE OF THE EMBRYO DEPICTED IN FIG. 1395. THE OPTIC CUP, CALICULUS OPHTHALMICUS, IN A LATER STAGE OF DEVELOPMENT.

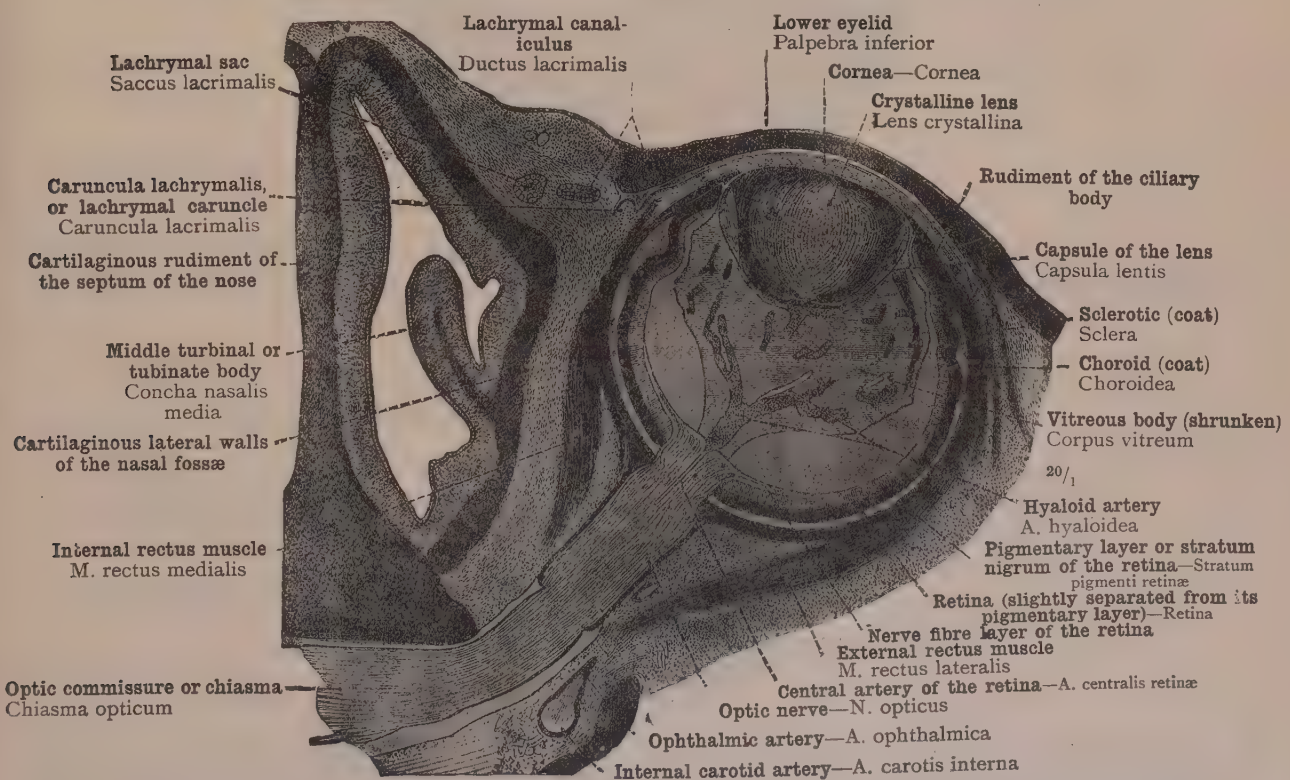


FIG. 1400.—HORIZONTAL SECTION THROUGH THE RIGHT EYE AND A PART OF THE NASAL FOSSÆ OF A HUMAN EMBRYO OF NINE WEEKS.

[1] See Appendix, note [507].

Development of the Eye.

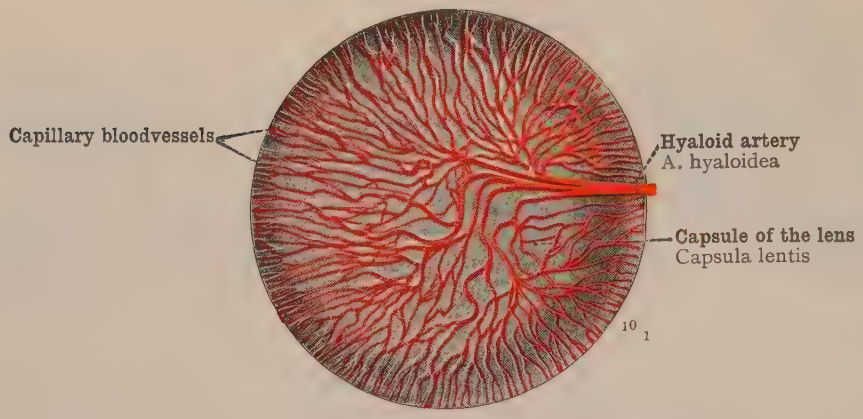


FIG. 1401.—THE RAMIFICATION OF THE HYALOID ARTERY, ARTERIA HYALOIDEA, ON THE POSTERIOR SURFACE OF THE LENS. FROM A HUMAN EMBRYO AT THE END OF THE FOURTH MONTH OF INTRA-UTERINE LIFE (MONTHS OF FOUR WEEKS EACH).

The bloodvessels have been injected.

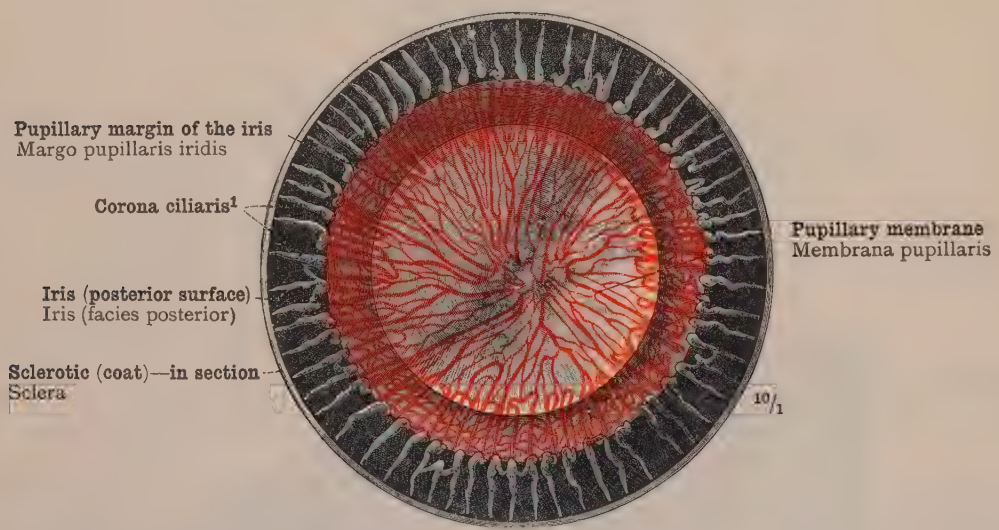


FIG. 1402.—THE BLOODVESSELS OF THE PUPILLARY MEMBRANE, MEMBRANA PUPILLARIS, AND OF THE IRIS. FROM A HUMAN EMBRYO AT THE END OF THE SIXTH MONTH OF INTRA-UTERINE LIFE (MONTHS OF FOUR WEEKS EACH).

The bloodvessels have been injected.

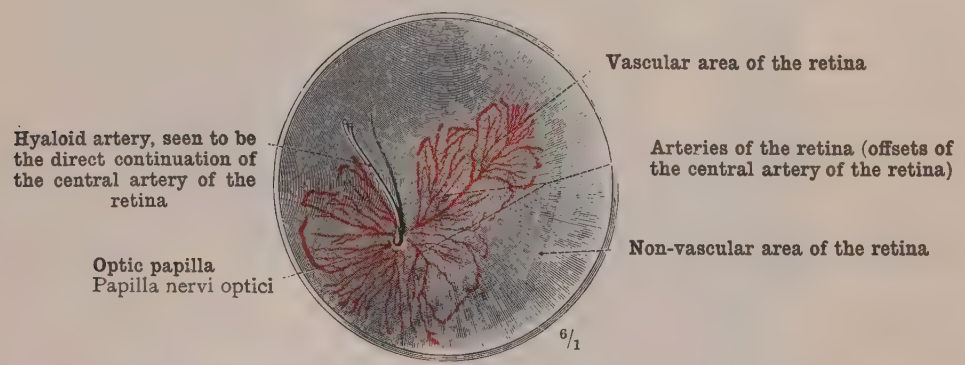

Vascular area of the retina
Hyaloid artery, seen to be the direct continuation of the central artery of the retina
Arteries of the retina (offsets of the central artery of the retina)
Non-vascular area of the retina
Optic papilla
Papilla nervi optici
6/1

FIG. 1403.—THE OBLITERATED HYALOID ARTERY, ARTERIA HYALOIDEA, PASSING FREELY FORWARDS FROM THE CENTRE OF THE OPTIC PAPILLA, AND DISPLAYED BY THE REMOVAL OF THE VITREOUS BODY. THE VASCULAR SYSTEM OF THE RETINA. POSTERIOR SEGMENT OF THE EYEBALL OF A NEW-BORN KITTEN, SEEN FROM BEFORE.

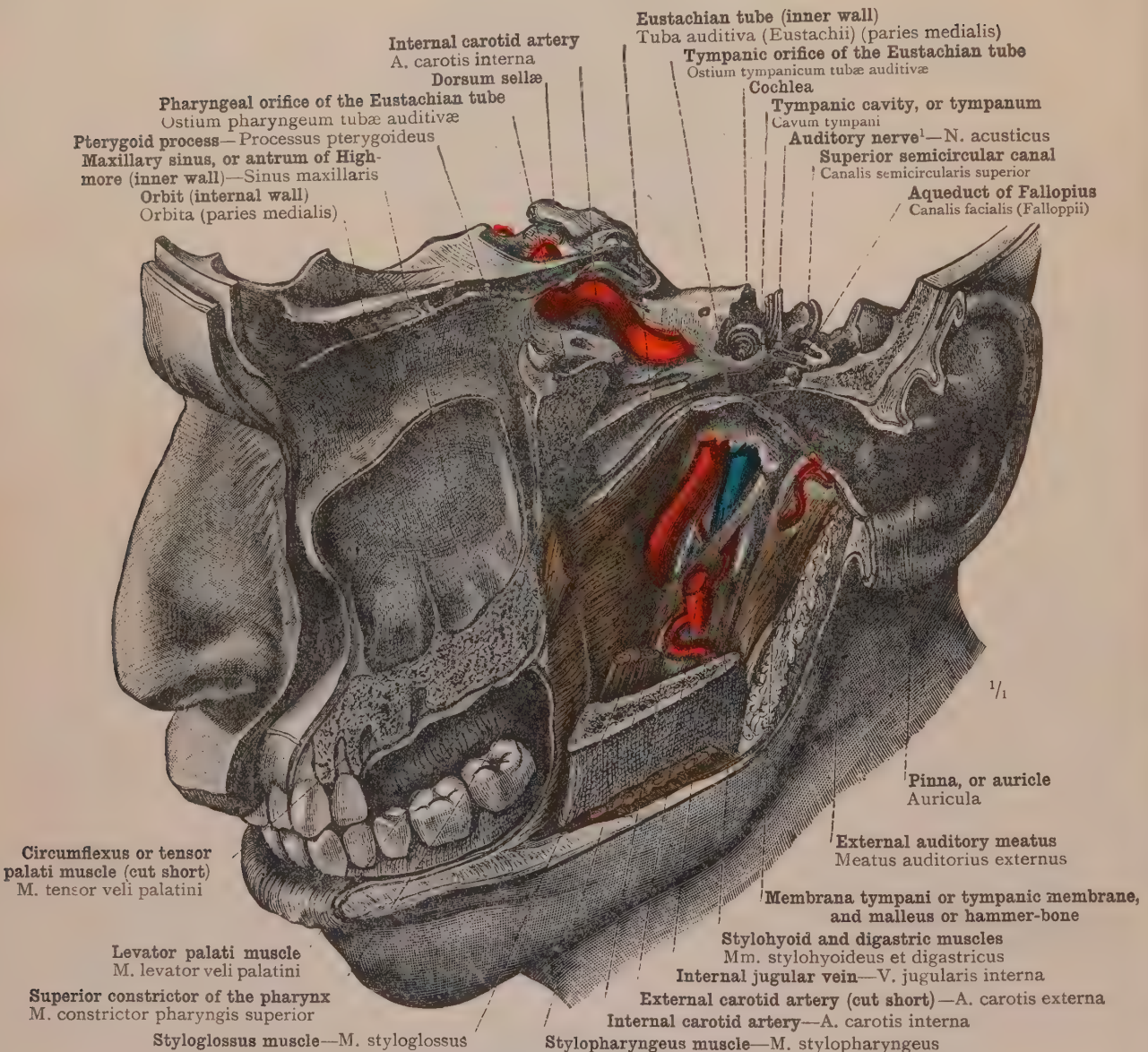
The bloodvessels have been injected.

[1] See Appendix, note 485.

Development of the Eye.

ORGANON AUDITUS

THE EAR

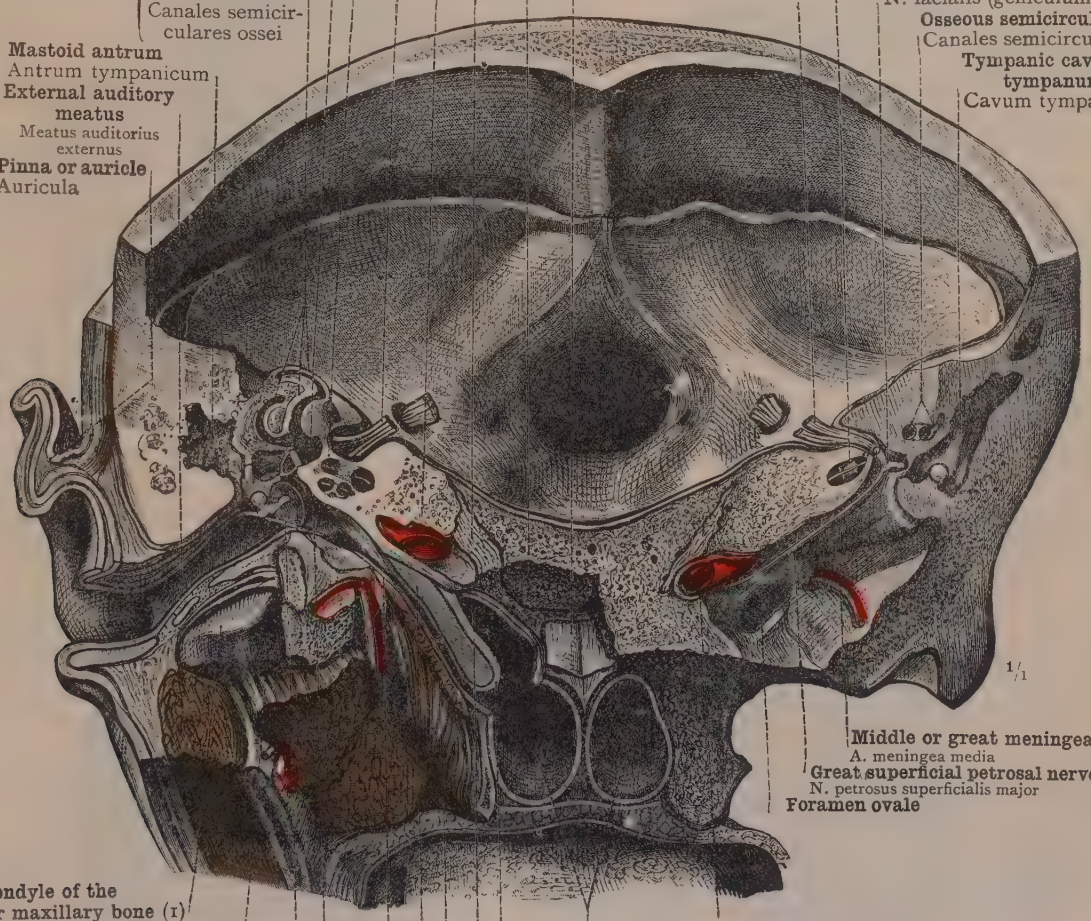


[1] *Eighth cranial nerve* in Soemmerring's enumeration: *portio mollis* of the *seventh cranial nerve* in that of Willis.

FIG. 1404.—GENERAL VIEW OF THE THREE PARTS OF THE ORGAN OF HEARING, SHOWING THEIR RELATIONS. SEEN FROM THE LEFT SIDE AND BEFORE. THE EXTERNAL EAR, AURIS EXTERNA: THE PINNA OR AURICLE, AURICULA, THE EXTERNAL AUDITORY MEATUS, MEATUS AUDITORIUS EXTERNUS, AND THE TYMPANIC MEMBRANE, MEMBRANA TYMPANI. THE MIDDLE EAR, AURIS MEDIA: THE TYMPANIC CAVITY OR TYMPANUM, CAVUM TYMPANI, AND THE EUSTACHIAN TUBE, TUBA AUDITIVA (EUSTACHII). THE INTERNAL EAR, AURIS INTERNA: THE LABYRINTH, LABYRINTHUS (AURIS), AND THE AUDITORY NERVE, NERVUS ACUSTICUS.

In a head hardened in alcohol a sagittal section was first made through the left superior maxillary bone and the left orbit, which behind, passing between the foramen rotundum and the foramen ovale, cut across the root of the great wing of the sphenoid and the internal pterygoid plate. The left ramus of the inferior maxillary bone having been cut away, a second section was made through the external auditory meatus and the tympanum, passing in front of the Eustachian tube and as far as the foramen lacerum medium; the Eustachian tube itself was opened by the removal of its outer wall as far as the pharyngeal orifice of the tube. The parts of the osseous labyrinth were exposed with the chisel.

General View of the Organ of Hearing.



(1) Capitulum mandibulæ (2) M. pterygoideus externus (3) Cavum tympani cum ossiculis auditus

[1] In Soemmerring's enumeration the *facial* is the *seventh*, the *auditory* is the *eighth cranial nerve;* in that of Willis the former is the *portio dura*, the latter the *portio mollis*, of the *seventh cranial nerve.*

FIG. 1405.—GENERAL VIEW OF THE THREE PARTS OF THE ORGAN OF HEARING. SEEN FROM ABOVE.

In a head hardened in chromic acid and alcohol, after the roof of the skull had been removed in the usual manner, a coronal section was made, passing through the hindmost part of the nasal septum and the foremost part of the soft palate. On the right side, by a saw-cut passing obliquely forwards, the parts of the organ of hearing situated in the petrous portion of the temporal bone were then fully opened, and the upper wall of the cartilaginous portion of the Eustachian tube was removed up to the opening of the tube into the nasopharynx. On the left side of the body the uppermost part of the petrous portion of the temporal bone with the roof of the tympanum was now removed.

General View of the Organ of Hearing.

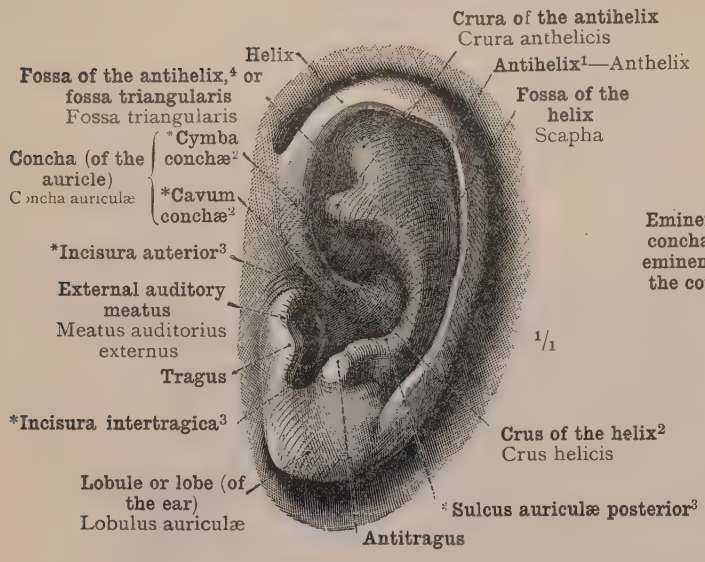


FIG. 1406.—THE LEFT PINNA OR AURICLE, AURICULA, OF A YOUNG WOMAN. OUTER SURFACE. HELIX AND ANTIHELIX[1]; TRAGUS AND ANTITRAGUS; CONCHA (OF THE AURICLE), CONCHA AURICULÆ; LOBULE OR LOBE (OF THE EAR), LOBULUS AURICULÆ.

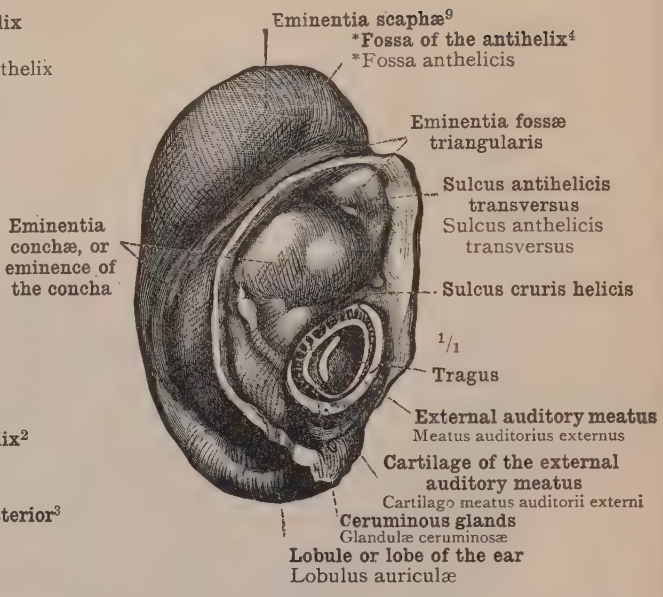


FIG. 1407.—THE INNER SURFACE OF THE SAME AURICLE.

The auricle was separated from the head along its line of attachment to the latter, and the cartilaginous portion of the external auditory meatus was cut across.

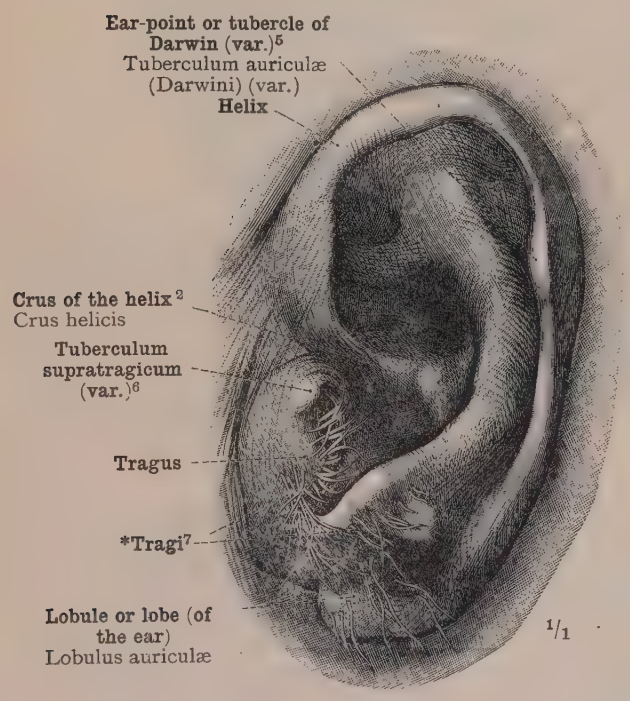


FIG. 1408.—THE LEFT PINNA OR AURICLE OF AN OLD MAN. OUTER SURFACE. *TRAGI[7]; EAR-POINT OR TUBERCLE OF DARWIN, TUBERCULUM AURICULÆ.[5]

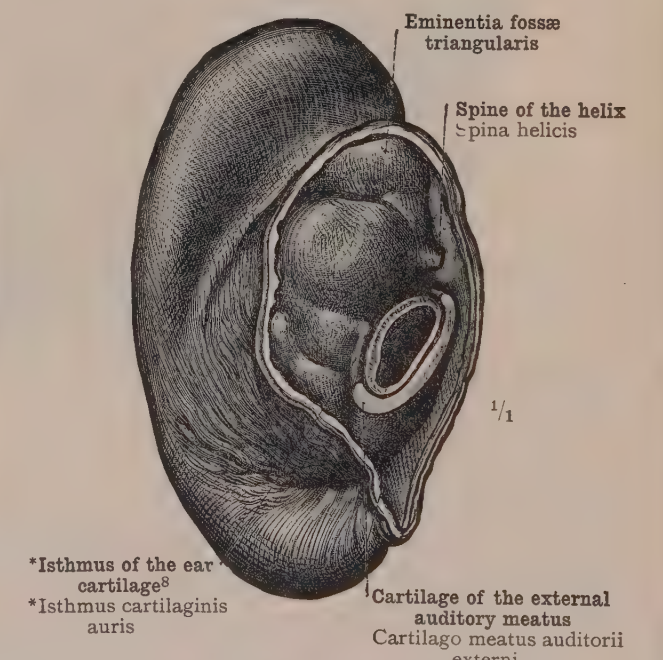


FIG. 1409.—THE INNER SURFACE OF THE SAME AURICLE.

The auricle was separated in the manner described at the foot of Fig. 1407.

1 The spelling *anthelix* is used sometimes in England also.
2 See Appendix, note 508.
3 These terms are used neither by Quain nor by Macalister. Their application is indicated by the figure.
4 See Appendix, note 509.
5 Sometimes called *Woolner's tip*, Darwin's attention having been drawn to this prominence by the sculptor Woolner.
6 A rounded prominence sometimes met with on the upper part of the tragus.
7 The name of **tragi* is given to the short, stiff hairs with which the entrance to the external auditory meatus is sometimes beset in elderly persons. The term is, however, rarely used in England.
8 This term is not used by Quain or Macalister. Examination of Fig. 1409 will show its signification.
9 The *eminentia scaphæ* is the eminence on the inner surface of the auricle corresponding to the *fossa of the helix* or *scapha* on the outer surface.

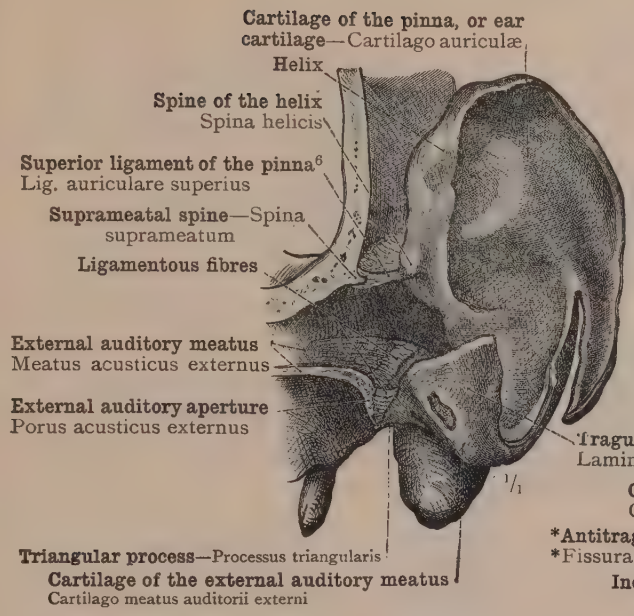


FIG. 1410.—THE CARTILAGE OF THE PINNA, OR EAR CARTILAGE, AND THE CARTILAGE OF THE EXTERNAL AUDITORY MEATUS, IN CONNEXION WITH THE TYMPANIC PORTION OF THE TEMPORAL BONE. LEFT EAR. OUTER SURFACE. SEEN FROM BEFORE.

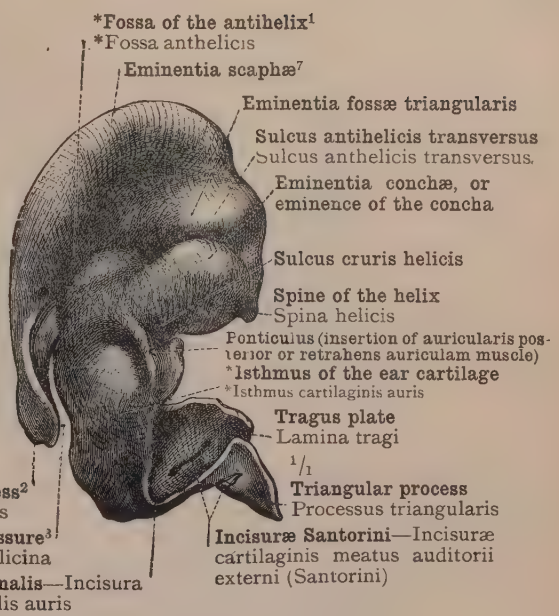


FIG. 1411.—THE CARTILAGE OF THE PINNA, OR EAR CARTILAGE, AND THE CARTILAGE OF THE EXTERNAL AUDITORY MEATUS, CARTILAGO AURICULÆ ET CARTILAGO MEATUS AUDITORII EXTERNI. LEFT EAR. INNER SURFACE. SEEN FROM BEHIND.

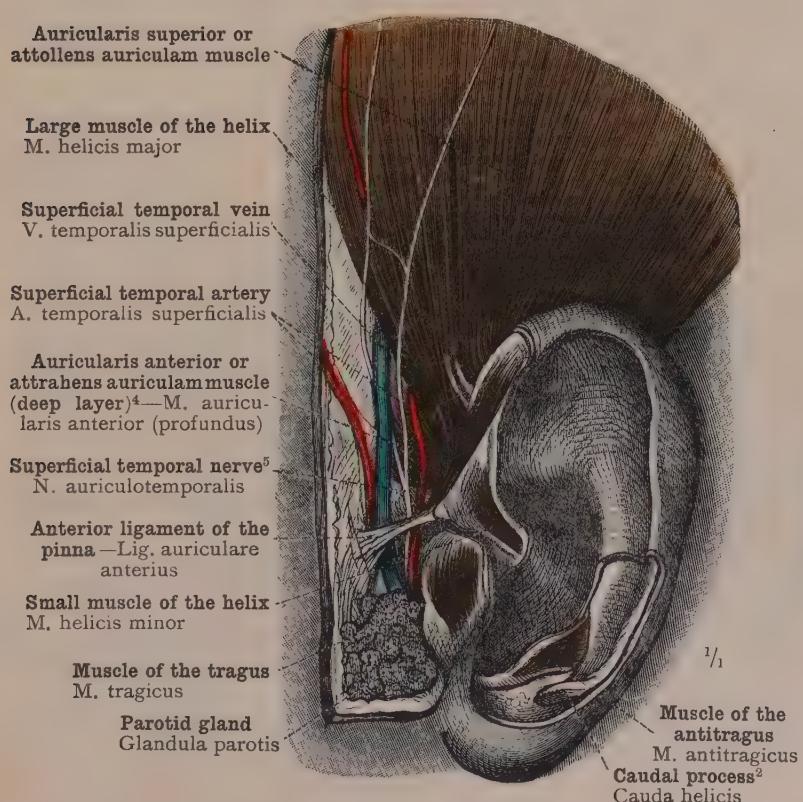


FIG. 1412.—THE MUSCLES (EXTRINSIC AND INTRINSIC) ON THE OUTER SURFACE OF THE PINNA OR AURICLE. LEFT EAR.

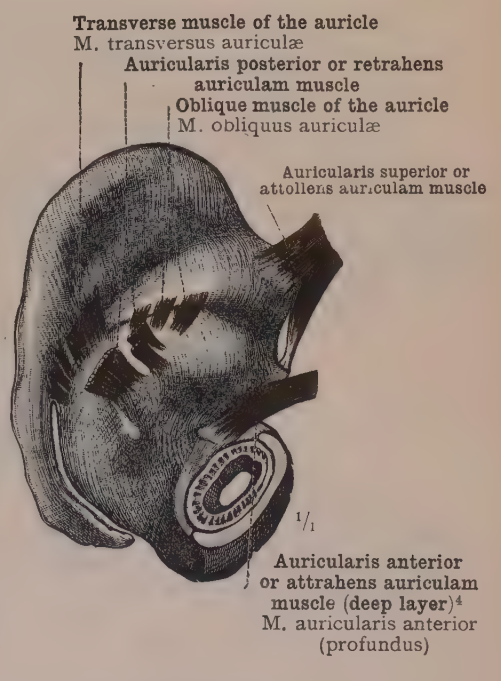

Transverse muscle of the auricle
M. transversus auriculæ
Auricularis posterior or retrahens auriculam muscle
Oblique muscle of the auricle
M. obliquus auriculæ
Auricularis superior or attollens auriculam muscle
1/1
Auricularis anterior or attrahens auriculam muscle (deep layer)[4]
M. auricularis anterior (profundus)

FIG. 1413.—THE MUSCLES (EXTRINSIC AND INTRINSIC) ON THE INNER SURFACE OF THE PINNA OR AURICLE. LEFT EAR.

[1] See Appendix, note 509. [2] By Macalister named *cauda helicis posterior*. [3] This term is not used by Quain or by Macalister.
[4] See Appendix, note 510. [5] See Appendix, note 459.
[6] Quain enumerates *anterior* and *posterior ligaments* only, making no mention of the *superior ligament of the pinna*.
[7] See note 9 to p. 920.

Auris externa—The external ear.—Auricula—The pinna or auricle.

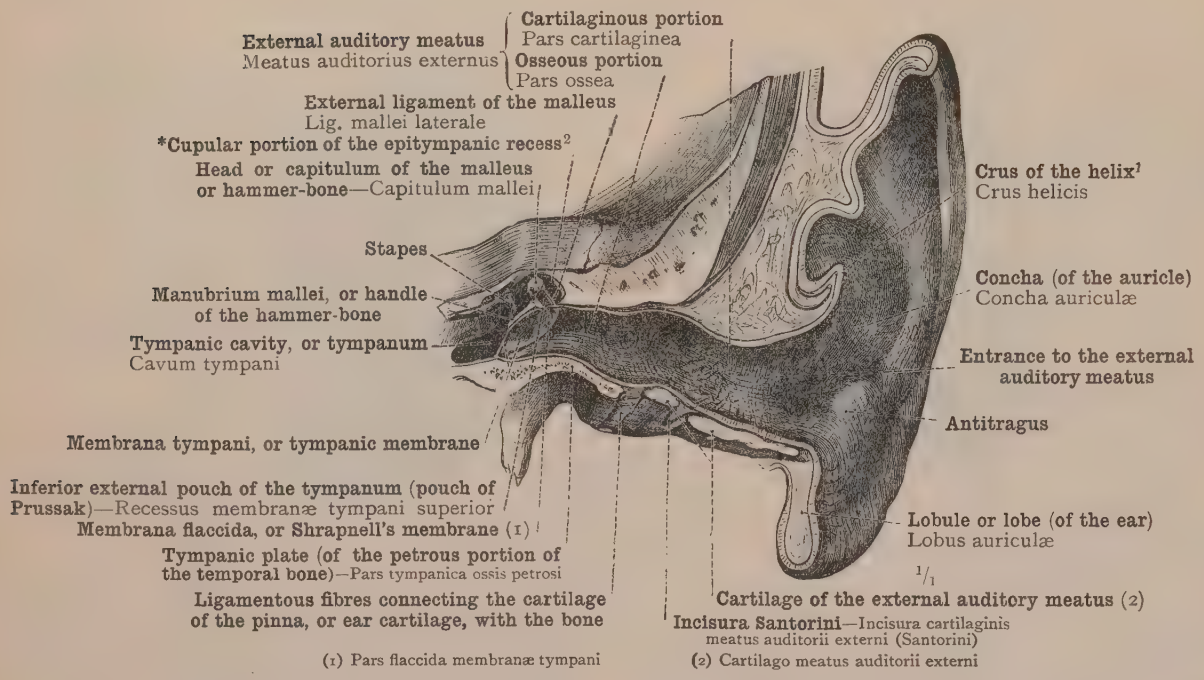

External auditory meatus
Meatus auditorius externus
Cartilaginous portion
Pars cartilaginea
Osseous portion
Pars ossea
External ligament of the malleus
Lig. mallei laterale
*Cupular portion of the epitympanic recess[2]
Head or capitulum of the malleus or hammer-bone—Capitulum mallei
Stapes
Manubrium mallei, or handle of the hammer-bone
Tympanic cavity, or tympanum
Cavum tympani
Membrana tympani, or tympanic membrane
Inferior external pouch of the tympanum (pouch of Prussak)—Recessus membranæ tympani superior
Membrana flaccida, or Shrapnell's membrane (1)
Tympanic plate (of the petrous portion of the temporal bone)—Pars tympanica ossis petrosi
Ligamentous fibres connecting the cartilage of the pinna, or ear cartilage, with the bone
Crus of the helix[1]
Crus helicis
Concha (of the auricle)
Concha auriculæ
Entrance to the external auditory meatus
Antitragus
Lobule or lobe (of the ear)
Lobus auriculæ
1/1
Cartilage of the external auditory meatus (2)
Incisura Santorini—Incisura cartilaginis meatus auditorii externi (Santorini)
(1) Pars flaccida membranæ tympani
(2) Cartilago meatus auditorii externi

FIG. 1414.—THE LEFT EXTERNAL AUDITORY MEATUS, MEATUS AUDITORIUS EXTERNUS, WITH THE MEMBRANA TYMPANI OR TYMPANIC MEMBRANE, CUT ACROSS PERPENDICULARLY THROUGHOUT ITS WHOLE LENGTH. THE CARTILAGINOUS AND OSSEOUS PORTIONS OF THE EXTERNAL AUDITORY MEATUS, PARS CARTILAGINEA ET PARS OSSEA MEATUS AUDITORII EXTERNI. THE EXPANSION OF THE EXTERNAL AUDITORY MEATUS INTO THE PINNA OR AURICLE, AND ITS CLOSURE BY THE MEMBRANA TYMPANI. SEEN FROM BEFORE.

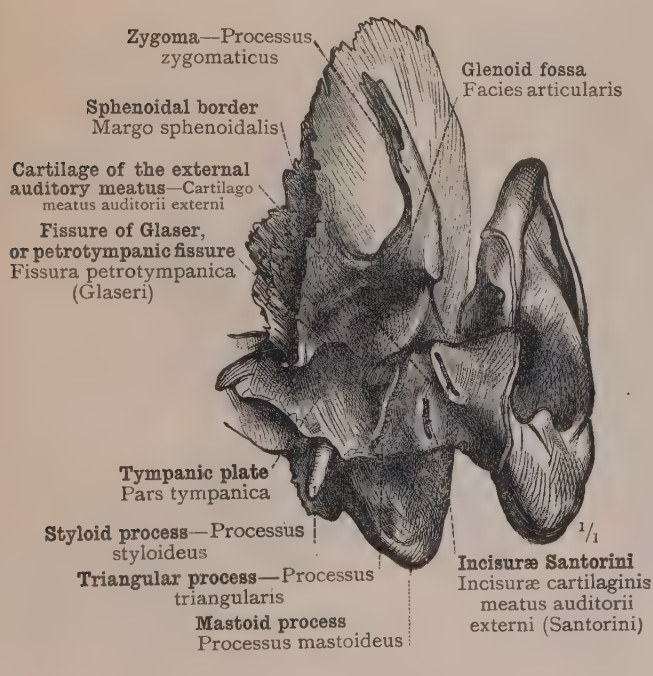


FIG. 1415.—THE WALL OF THE OSSEOUS AND CARTILAGINOUS PORTIONS OF THE EXTERNAL AUDITORY MEATUS LAID BARE. SEEN FROM BELOW AND BEFORE. LEFT EAR.

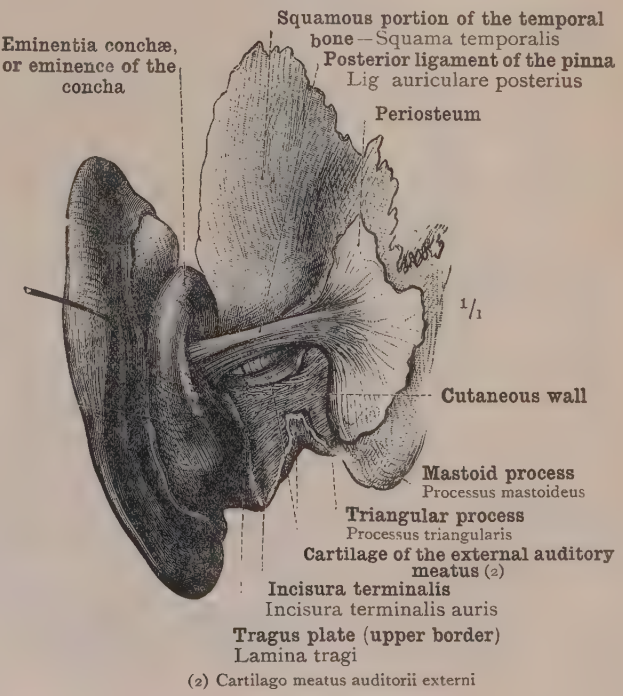


FIG. 1416.—THE WALL OF THE CARTILAGINOUS PORTION OF THE EXTERNAL AUDITORY MEATUS LAID BARE. SEEN FROM BEHIND. LEFT EAR.

[1] See Appendix, note 508.

[2] See Appendix, note 511.

Auris externa—The external ear.—Meatus auditorius externus—The external auditory meatus.

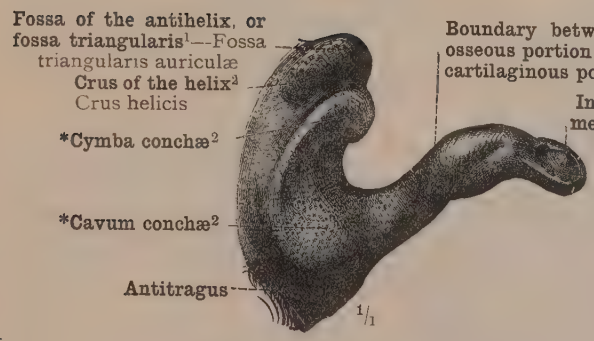

Fossa of the antihelix, or fossa triangularis[1]—Fossa triangularis auriculæ
Crus of the helix[2] Crus helicis
*Cymba conchæ[2]
*Cavum conchæ[2]
Antitragus
Boundary between the osseous portion and the cartilaginous portion
Impression of the membrana tympani or tympanic membrane
1/1

FIG. 1417.—SEEN FROM BEHIND.

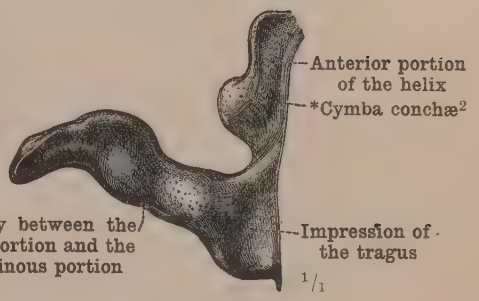

Anterior portion of the helix
*Cymba conchæ[2]
Boundary between the osseous portion and the cartilaginous portion
Impression of the tragus
1/1

FIG. 1418.—SEEN FROM BEFORE.

CAST OF THE LEFT EXTERNAL AUDITORY MEATUS AND THE ADJOINING PORTIONS OF THE PINNA OR AURICLE, TAKEN WITH FUSIBLE METAL. SHAPE AND DIMENSIONS OF THE EXTERNAL AUDITORY MEATUS.

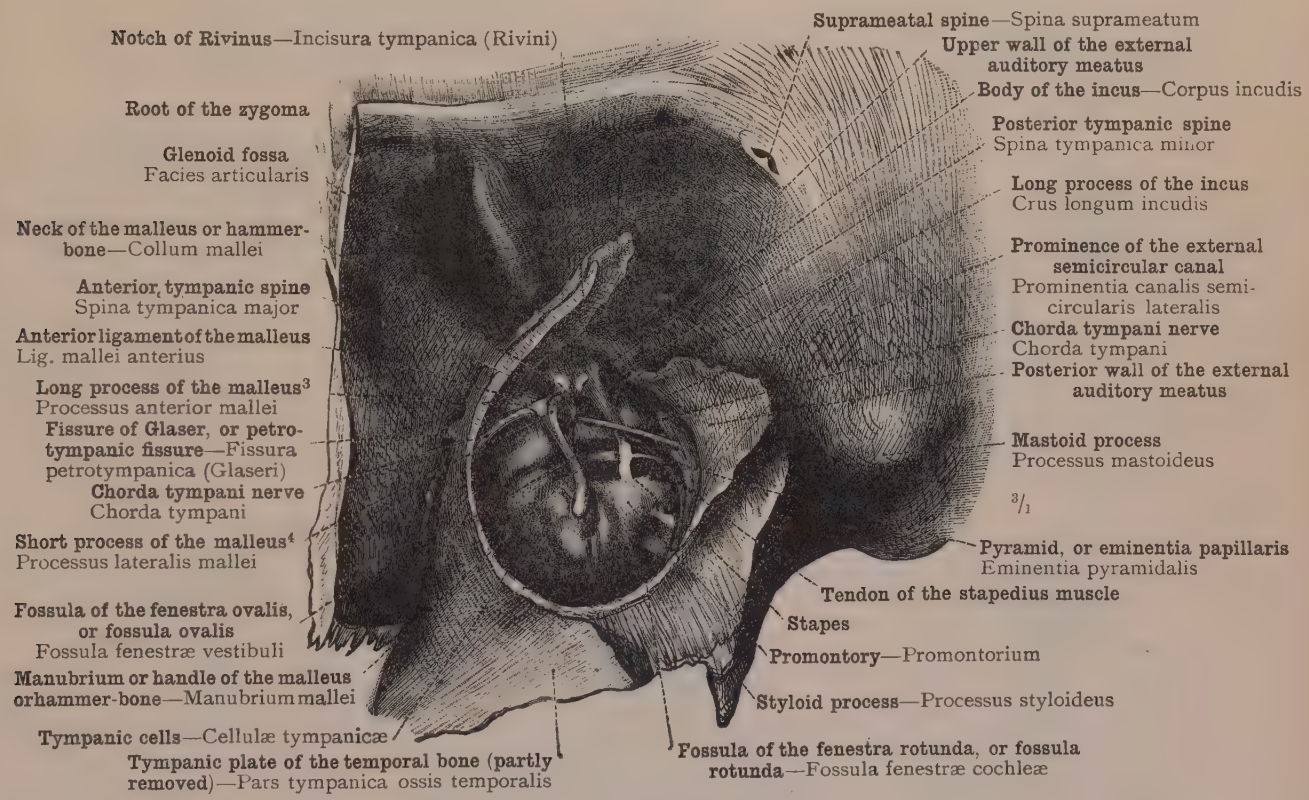

Notch of Rivinus—Incisura tympanica (Rivini)
Root of the zygoma
Glenoid fossa Facies articularis
Neck of the malleus or hammer-bone—Collum mallei
Anterior tympanic spine Spina tympanica major
Anterior ligament of the malleus Lig. mallei anterius
Long process of the malleus[3] Processus anterior mallei
Fissure of Glaser, or petro-tympanic fissure—Fissura petrotympanica (Glaseri)
Chorda tympani nerve Chorda tympani
Short process of the malleus[4] Processus lateralis mallei
Fossula of the fenestra ovalis, or fossula ovalis Fossula fenestræ vestibuli
Manubrium or handle of the malleus orhammer-bone—Manubrium mallei
Tympanic cells—Cellulæ tympanicæ
Tympanic plate of the temporal bone (partly removed)—Pars tympanica ossis temporalis
Suprameatal spine—Spina suprameatum
Upper wall of the external auditory meatus
Body of the incus—Corpus incudis
Posterior tympanic spine Spina tympanica minor
Long process of the incus Crus longum incudis
Prominence of the external semicircular canal Prominentia canalis semi-circularis lateralis
Chorda tympani nerve Chorda tympani
Posterior wall of the external auditory meatus
Mastoid process Processus mastoideus
3/1
Pyramid, or eminentia papillaris Eminentia pyramidalis
Tendon of the stapedius muscle
Stapes
Promontory—Promontorium
Styloid process—Processus styloideus
Fossula of the fenestra rotunda, or fossula rotunda—Fossula fenestræ cochleæ

FIG. 1419.—THE INNERMOST PORTION OF THE EXTERNAL AUDITORY MEATUS AND THE RELATION THERETO OF THE STRUCTURES IN THE TYMPANIC CAVITY OR TYMPANUM, DISPLAYED BY THE REMOVAL OF THE GREATER PART OF THE EXTERNAL AUDITORY MEATUS AND OF THE MEMBRANA TYMPANI OR TYMPANIC MEMBRANE. VIEW INTO THE TYMPANIC CAVITY OR TYMPANUM; THE THREE AUDITORY OSSICLES ARE SEEN IN THEIR NATURAL POSITION; THE TENDON OF THE STAPEDIUS MUSCLE AND THE CHORDA TYMPANI NERVE ARE ALSO VISIBLE, AS WELL AS THE PARTS ON THE INNER WALL, PARIES LABYRINTHICUS, OF THE TYMPANIC CAVITY. LEFT EAR.

1 See Appendix, note 509. 2 See Appendix, note 508. 3 Also called *processus gracilis* vel *Folianus mallei.*
4 Also called *processus brevis* vel *obtusus mallei.*

Auris externa—The external ear.—Meatus auditorius externus—The external auditory meatus.

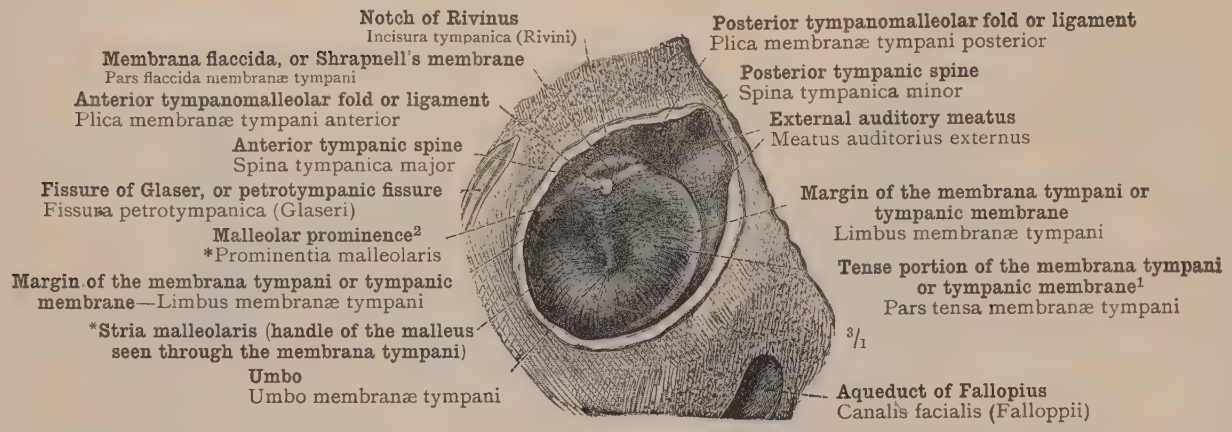

Notch of Rivinus
Incisura tympanica (Rivini)
Membrana flaccida, or Shrapnell's membrane
Pars flaccida membranæ tympani
Anterior tympanomalleolar fold or ligament
Plica membranæ tympani anterior
Anterior tympanic spine
Spina tympanica major
Fissure of Glaser, or petrotympanic fissure
Fissura petrotympanica (Glaseri)
Malleolar prominence[2]
*Prominentia malleolaris
Margin of the membrana tympani or tympanic membrane—Limbus membranæ tympani
*Stria malleolaris (handle of the malleus seen through the membrana tympani)
Umbo
Umbo membranæ tympani
Posterior tympanomalleolar fold or ligament
Plica membranæ tympani posterior
Posterior tympanic spine
Spina tympanica minor
External auditory meatus
Meatus auditorius externus
Margin of the membrana tympani or tympanic membrane
Limbus membranæ tympani
Tense portion of the membrana tympani or tympanic membrane[1]
Pars tensa membranæ tympani
3/1
Aqueduct of Fallopius
Canalis facialis (Falloppii)

FIG. 1420.—OUTER SURFACE OF THE LEFT MEMBRANA TYMPANI OR TYMPANIC MEMBRANE.

The external auditory meatus has been removed by a saw-cut passing close to the tympanic membrane in a plane parallel to the plane of that membrane.

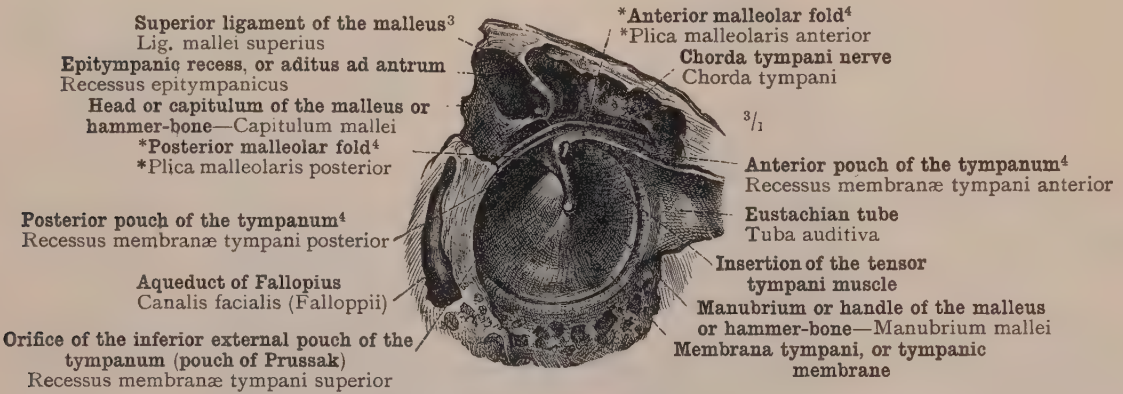

Superior ligament of the malleus[3]
Lig. mallei superius
Epitympanic recess, or aditus ad antrum
Recessus epitympanicus
Head or capitulum of the malleus or hammer-bone—Capitulum mallei
*Posterior malleolar fold[4]
*Plica malleolaris posterior
Posterior pouch of the tympanum[4]
Recessus membranæ tympani posterior
Aqueduct of Fallopius
Canalis facialis (Falloppii)
Orifice of the inferior external pouch of the tympanum (pouch of Prussak)
Recessus membranæ tympani superior
*Anterior malleolar fold[4]
*Plica malleolaris anterior
Chorda tympani nerve
Chorda tympani
3/1
Anterior pouch of the tympanum[4]
Recessus membranæ tympani anterior
Eustachian tube
Tuba auditiva
Insertion of the tensor tympani muscle
Manubrium or handle of the malleus or hammer-bone—Manubrium mallei
Membrana tympani, or tympanic membrane

FIG. 1421.—INNER OR TYMPANIC SURFACE OF THE LEFT MEMBRANA TYMPANI OR TYMPANIC MEMBRANE, WITH THE ANTERIOR AND POSTERIOR TYMPANIC POUCHES (OF TRÖLTSCH), RECESSUS MEMBRANÆ TYMPANI ANTERIOR ET POSTERIOR.

Displayed by a saw-cut traversing the tympanum close to the tympanic membrane in a plane parallel to the plane of that membrane, and by the removal of the incus.

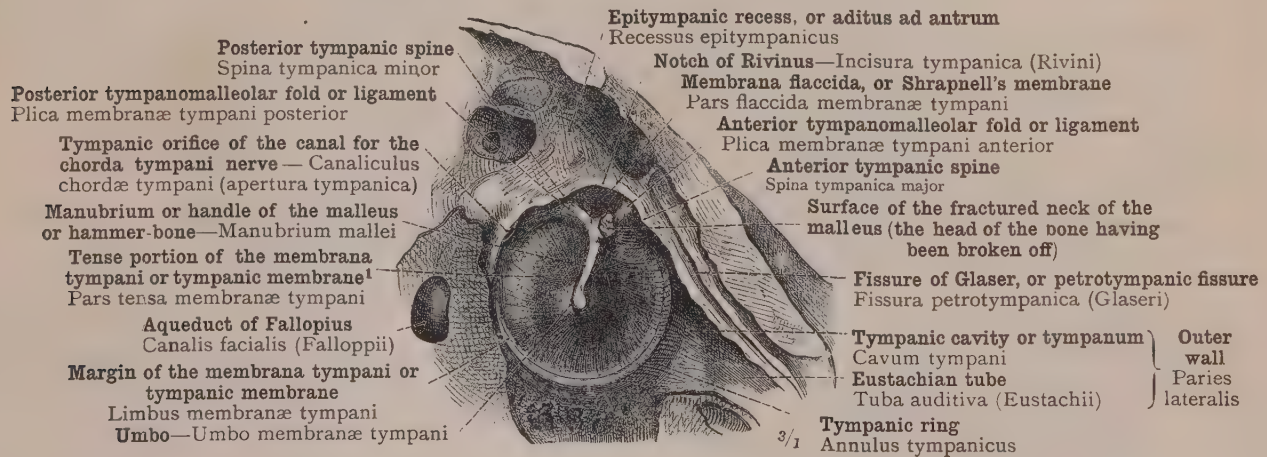

Posterior tympanic spine
Spina tympanica minor
Posterior tympanomalleolar fold or ligament
Plica membranæ tympani posterior
Tympanic orifice of the canal for the chorda tympani nerve — Canaliculus chordæ tympani (apertura tympanica)
Manubrium or handle of the malleus or hammer-bone—Manubrium mallei
Tense portion of the membrana tympani or tympanic membrane[1]
Pars tensa membranæ tympani
Aqueduct of Fallopius
Canalis facialis (Falloppii)
Margin of the membrana tympani or tympanic membrane
Limbus membranæ tympani
Umbo—Umbo membranæ tympani
Epitympanic recess, or aditus ad antrum
Recessus epitympanicus
Notch of Rivinus—Incisura tympanica (Rivini)
Membrana flaccida, or Shrapnell's membrane
Pars flaccida membranæ tympani
Anterior tympanomalleolar fold or ligament
Plica membranæ tympani anterior
Anterior tympanic spine
Spina tympanica major
Surface of the fractured neck of the malleus (the head of the bone having been broken off)
Fissure of Glaser, or petrotympanic fissure
Fissura petrotympanica (Glaseri)
Tympanic cavity or tympanum
Cavum tympani
Eustachian tube
Tuba auditiva (Eustachii)
Outer wall
Paries lateralis
Tympanic ring
Annulus tympanicus
3/1

FIG. 1422.—INNER OR TYMPANIC SURFACE OF THE LEFT MEMBRANA TYMPANI OR TYMPANIC MEMBRANE.

In order to lay bare the membrana flaccida (pars flaccida membranæ tympani) the head of the malleus was removed, together with the adjoining folds of the mucous membrane.

1 See Appendix, note 512. 2 See Appendix, note 513. 3 Sometimes called the *suspensory ligament of the malleus*. 4 See Appendix, note 514.

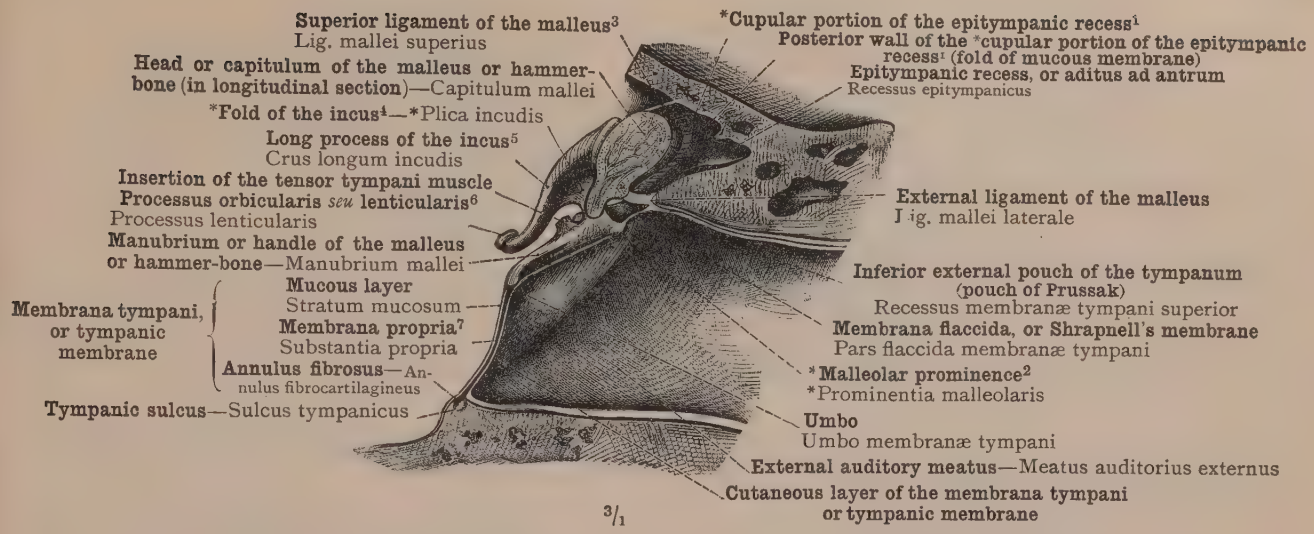

Superior ligament of the malleus[3]
Lig. mallei superius
Head or capitulum of the malleus or hammer-bone (in longitudinal section)—Capitulum mallei
*Fold of the incus[4]—*Plica incudis
Long process of the incus[5]
Crus longum incudis
Insertion of the tensor tympani muscle
Processus orbicularis seu lenticularis[6]
Processus lenticularis
Manubrium or handle of the malleus or hammer-bone—Manubrium mallei
Membrana tympani, or tympanic membrane
Mucous layer
Stratum mucosum
Membrana propria[7]
Substantia propria
Annulus fibrosus—Annulus fibrocartilagineus
Tympanic sulcus—Sulcus tympanicus
*Cupular portion of the epitympanic recess[1]
Posterior wall of the *cupular portion of the epitympanic recess[1] (fold of mucous membrane)
Epitympanic recess, or aditus ad antrum
Recessus epitympanicus
External ligament of the malleus
Lig. mallei laterale
Inferior external pouch of the tympanum (pouch of Prussak)
Recessus membranæ tympani superior
Membrana flaccida, or Shrapnell's membrane
Pars flaccida membranæ tympani
*Malleolar prominence[2]
*Prominentia malleolaris
Umbo
Umbo membranæ tympani
External auditory meatus—Meatus auditorius externus
Cutaneous layer of the membrana tympani or tympanic membrane
3/1

FIG. 1423.—CORONAL SECTION THROUGH THE LEFT MEMBRANA TYMPANI OR TYMPANIC MEMBRANE AND THE ADJOINING PORTION OF THE EXTERNAL AUDITORY MEATUS, IN A SPECIMEN FIRST HARDENED IN CHROMIC ACID AND ALCOHOL AND SUBSEQUENTLY DECALCIFIED IN HYDROCHLORIC ACID. THE SECTION PASSES THROUGH THE HEAD OR CAPITULUM OF THE MALLEUS OR HAMMER-BONE, AND LEAVES THE MANUBRIUM OR HANDLE OF THAT BONE INTACT BEHIND THE PLANE OF SECTION. SEEN FROM BEFORE. THE MUCOUS MEMBRANE OF THE RECESSUS EPITYMPANICUS OR ADITUS AD ANTRUM.

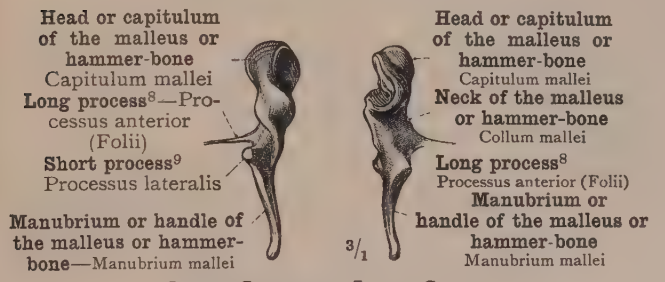


FIG 1424.—THE LEFT MALLEUS OR HAMMER-BONE.

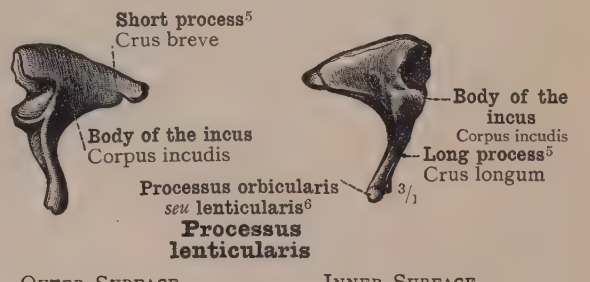


FIG. 1425.—THE LEFT INCUS.

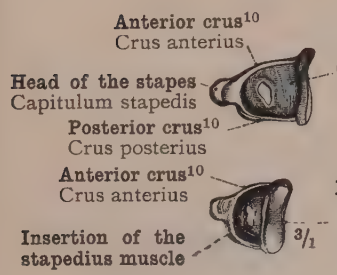


FIG. 1426.—THE LEFT STAPES, WITH THE OBTURATOR MEMBRANE,[11] SEEN OBLIQUELY FROM THE UPPER AND INNER SIDE.

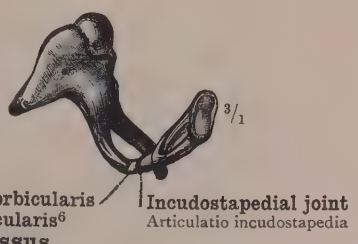


FIG. 1427.—THE AUDITORY OSSICLES OF THE LEFT EAR, SEEN FROM BEHIND IN THEIR NATURAL POSITION.

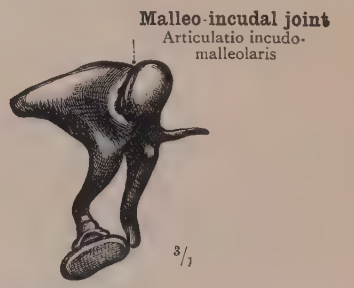


FIG. 1428.—THE AUDITORY OSSICLES OF THE LEFT EAR, SEEN FROM ABOVE IN THEIR NATURAL POSITION.

[1] See Appendix, note 512. [2] See Appendix, note 513.
[3] Sometimes called the *suspensory ligament of the malleus.* [4] See Appendix, note 515.
[5] The processes of the incus are often known in England by their Latin names of *crus longum* and *crus breve.*
[6] See Appendix, note 516. [7] See Appendix, note 517.
[8] Also known as the *processus gracilis* vel *Folianus.* [9] Also known as the *processus brevis* vel *obtusus.*
[10] See Appendix, note 518. [11] See Appendix, note 519.
[12] Sometimes called the *foot-plate of the stapes.*

Auris media—The middle ear.—Ossicula auditus—The auditory ossicles.

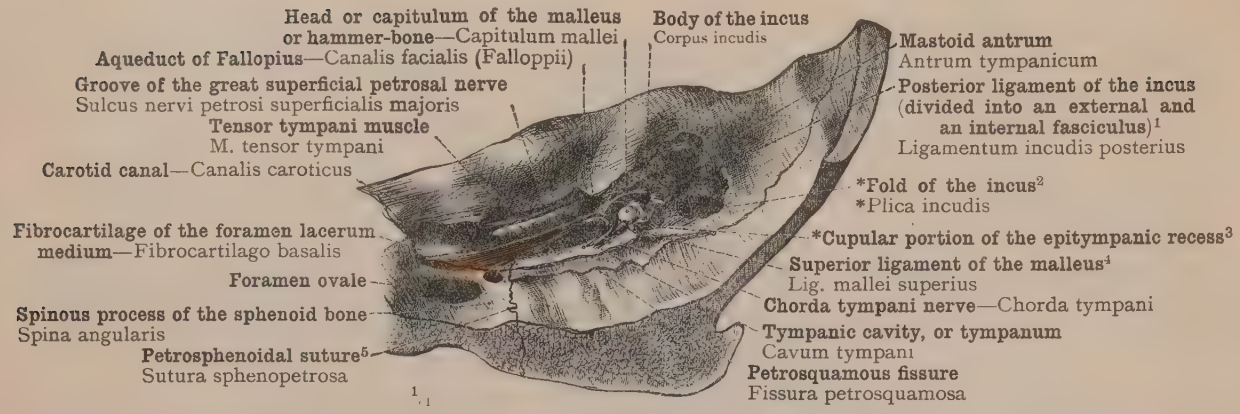


FIG. 1429.—THE LEFT TYMPANIC CAVITY OR TYMPANUM, CAVUM TYMPANI, OPENED BY THE REMOVAL OF ITS ROOF,[6] PARIES TEGMENTALIS. SEEN FROM ABOVE. TENSOR TYMPANI MUSCLE.

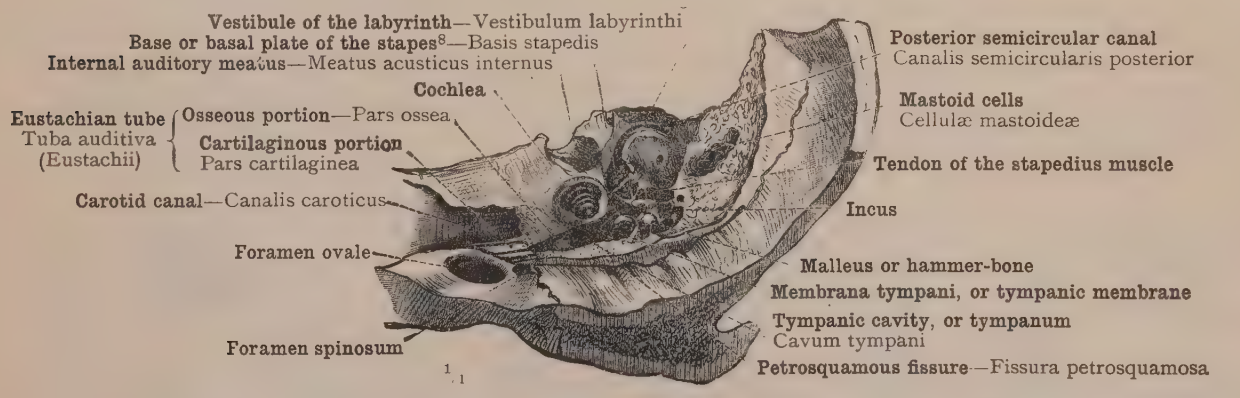


FIG. 1430.—THE LEFT TYMPANUM OR TYMPANIC CAVITY, AND ITS RELATION TO THE LABYRINTH, DISPLAYED BY THE REMOVAL OF THE UPPER PART OF THE PETROUS PORTION OF THE TEMPORAL BONE. SEEN FROM ABOVE.

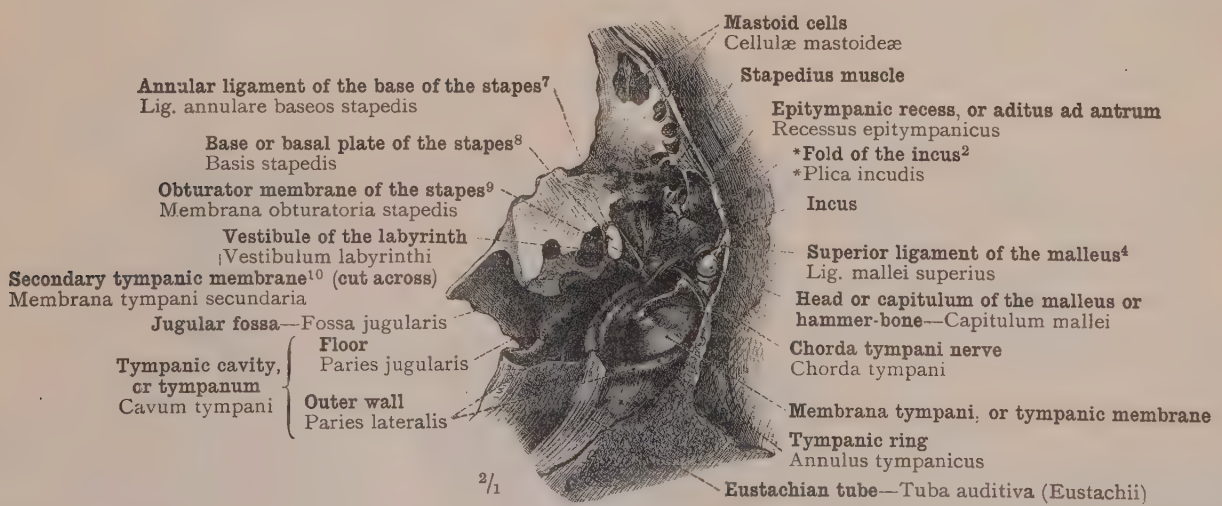


FIG. 1431.—THE LEFT TYMPANUM OR TYMPANIC CAVITY, WITH THE MEMBRANA TYMPANI OR TYMPANIC MEMBRANE, THE AUDITORY OSSICLES, AND THE STAPEDIUS MUSCLE. SEEN FROM ABOVE.

1 See Appendix, note 520. 2 See Appendix, note 515. 3 See Appendix, note 511.
4 Known also as the *suspensory ligament of the malleus.* 5 See Appendix, note 521. 6 See Appendix, note 522.
7 Also known as the *membrane of the fenestra ovalis.* 8 Also known as the *foot-plate of the stapes.*
9 See Appendix, note 519. 10 See Appendix, note 523.

Auris media—The middle ear.—Cavum tympani—The tympanic cavity or tympanum.

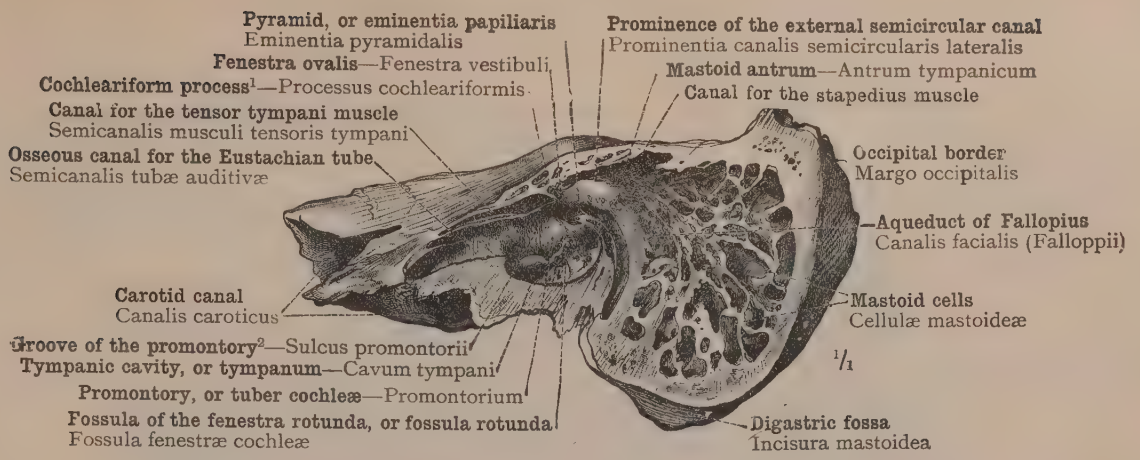


FIG. 1432.—THE INNER WALL, PARIES LABYRINTHICUS, OF THE LEFT TYMPANIC CAVITY (OSSEOUS SURFACE), AND THE MASTOID CELLS, CELLULÆ MASTOIDEÆ, DISPLAYED BY A SECTION PASSING THROUGH THE MASTOID PROCESS AND THE FRONT OF THE PETROUS PORTION OF THE TEMPORAL BONE. SEEN FROM BEFORE AND THE OUTER SIDE

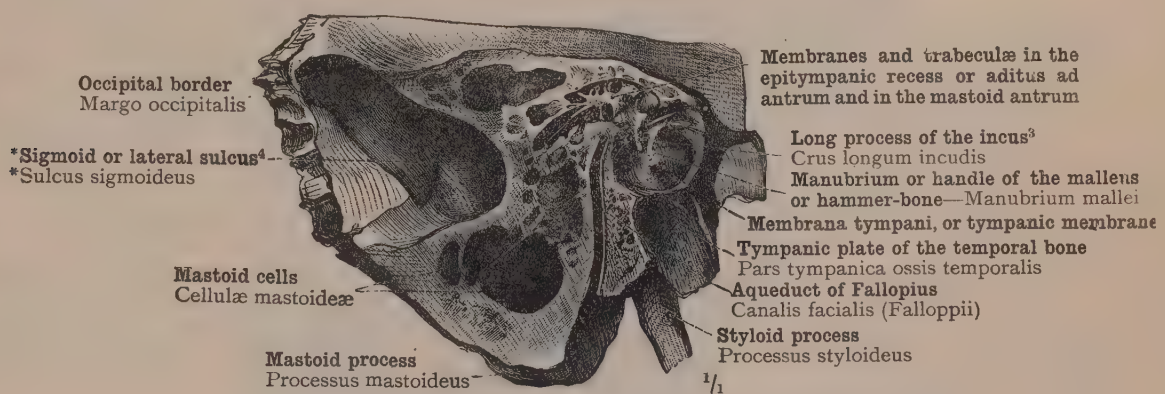


FIG. 1433.—THE OUTER WALL, PARIES MEMBRANACEUS, OF THE LEFT TYMPANIC CAVITY, AND THE ENTRANCE TO THE MASTOID CELLS. THE MASTOID ANTRUM, ANTRUM TYMPANICUM, IS TRAVERSED BY BRANCHING TRABECULÆ OF CONNECTIVE TISSUE. SEEN FROM THE INNER SIDE.

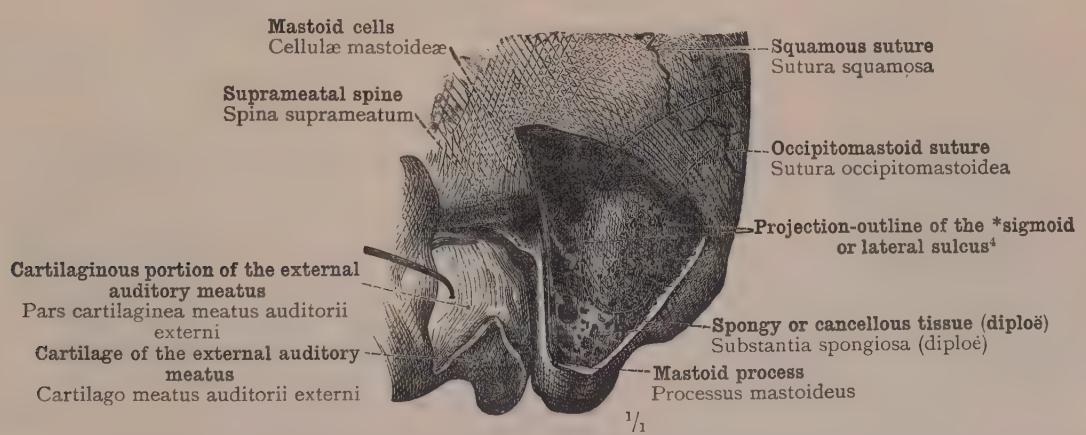
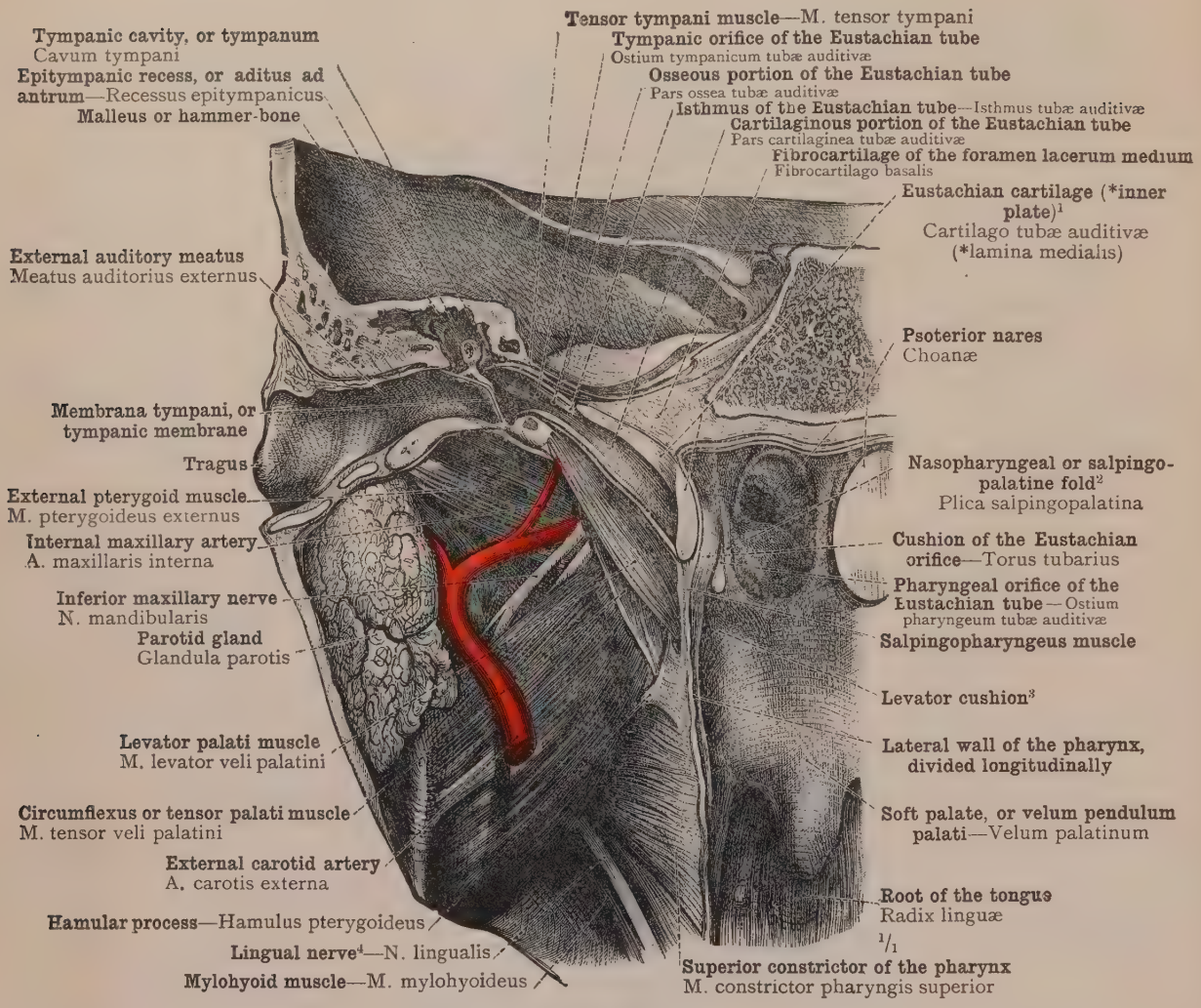


FIG. 1434.—THE MASTOID CELLS IN RELATION TO THE EXTERNAL AUDITORY MEATUS AND TO THE *SIGMOID OR LATERAL SINUS.[4] THE PROJECTION-OUTLINE OF THE SINUS IS INDICATED BY AN INTERRUPTED LINE. LEFT EAR. SEEN FROM THE OUTER SIDE.

The mastoid cells are in this specimen but slightly developed.

1 See Appendix, note 524. 2 See Appendix, note 525.
3 Often known in England also by the Latin name of *crus longum incudis*.
4 Regarding the use of the term **sigmoid sulcus*, lodging the **sigmoid sinus*, see note 264 to Part V In Part I. the usual English name of *lateral sulcus* only was employed (see Fig. 129, p. 63).



1 See Appendix, note 526. 2 See Appendix to Part IV., note 4. 3 See Appendix, note 527. 4 Formerly known also as the *gustatory nerve.*

FIG. 1435.—THE EUSTACHIAN TUBE, TUBA AUDITIVA (EUSTACHII), WITH THE TYMPANIC CAVITY OR TYMPANUM AND THE EXTERNAL AUDITORY MEATUS, SEEN FROM BEHIND.

In the anterior segment of a head divided in the direction of the external auditory meatus, the left Eustachian tube was exposed from behind up to the lateral wall of the pharynx, and was opened by the removal of its inner wall. Of the *inner plate (*see Appendix, note* 526) of the Eustachian cartilage, the uppermost portion only, divided longitudinally, and the foremost portion, which is imbedded in the wall of the pharynx and thus forms the cushion of the Eustachian orifice, torus tubarius, have been preserved. The levator palati muscle, musculus levator veli palatini, the circumflexus, or tensor palati muscle, musculus tensor veli palatini, the superior constrictor of the pharynx, musculus constrictor pharyngis superior, the external and internal pterygoid muscles, musculi pterygoidei, externus and internus, the arteries and nerves passing between the last-named muscles, and the posterior surface of the parotid gland, were then exposed. Finally, the pharynx was opened by the removal of its posterior wall, so that its left lateral wall is seen in longitudinal section, and the cushion of the Eustachian orifice and the pharyngeal orifice of the Eustachian tube, situate just in front of this eminence, are also visible.

Auris media—The middle ear.—Tuba auditiva—The Eustachian tube.

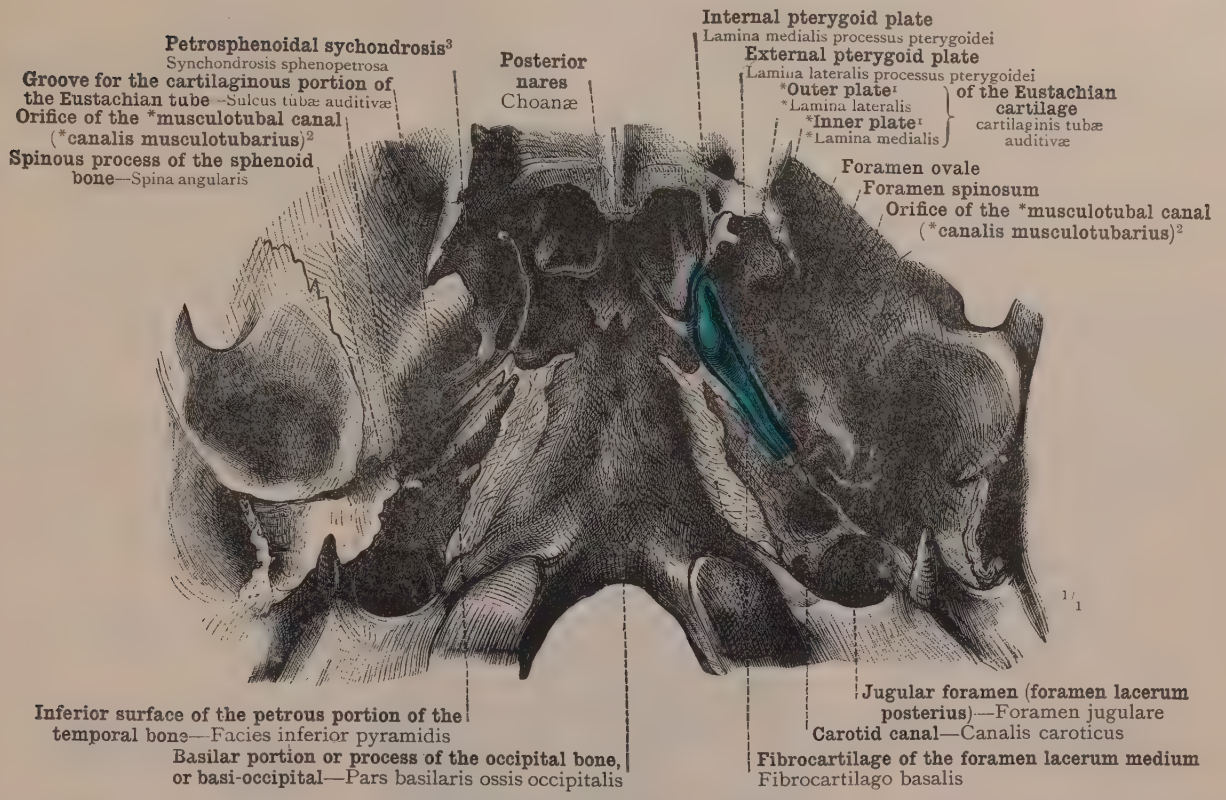

Petrosphenoidal sychondrosis[3]
Synchondrosis sphenopetrosa
Groove for the cartilaginous portion of the Eustachian tube—Sulcus tubæ auditivæ
Orifice of the *musculotubal canal (*canalis musculotubarius)[2]
Spinous process of the sphenoid bone—Spina angularis
Posterior nares
Choanæ
Internal pterygoid plate
Lamina medialis processus pterygoidei
External pterygoid plate
Lamina lateralis processus pterygoidei
*Outer plate[1] *Lamina lateralis
*Inner plate[1] *Lamina medialis
of the Eustachian cartilage
cartilaginis tubæ auditivæ
Foramen ovale
Foramen spinosum
Orifice of the *musculotubal canal (*canalis musculotubarius)[2]
1/1
Inferior surface of the petrous portion of the temporal bone—Facies inferior pyramidis
Basilar portion or process of the occipital bone, or basi-occipital—Pars basilaris ossis occipitalis
Jugular foramen (foramen lacerum posterius)—Foramen jugulare
Carotid canal—Canalis caroticus
Fibrocartilage of the foramen lacerum medium
Fibrocartilago basalis

FIG. 1436.—A PART OF THE OUTER OR INFERIOR SURFACE OF THE BASE OF THE SKULL, ON THE LEFT SIDE OF WHICH THE EUSTACHIAN CARTILAGE, CARTILAGO TUBÆ AUDITIVÆ, IS EXPOSED IN ITS NATURAL POSITION AND WITH ITS NATURAL CONNEXIONS WITH THE BONES. ON THE RIGHT SIDE THE GROOVE FOR THE CARTILAGINOUS PORTION OF THE EUSTACHIAN TUBE, SULCUS TUBÆ AUDITIVÆ, IS LAID BARE.

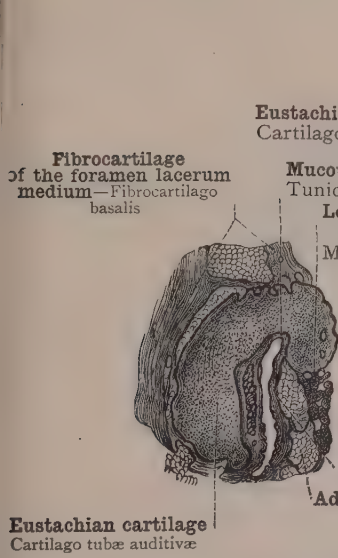


FIG. 1437.—NEAR THE OSSEOUS PORTION.

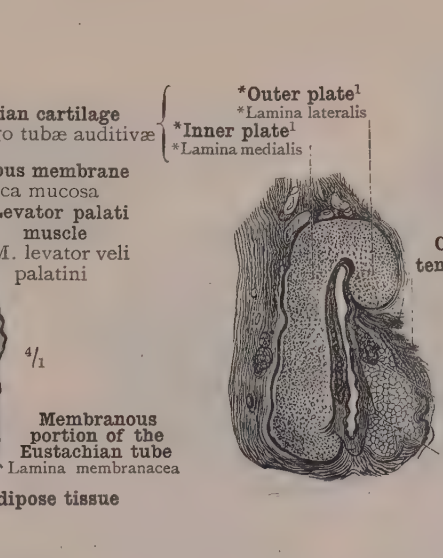


FIG. 1438.—MIDDLE OF THE CARTILAGINOUS PORTION.

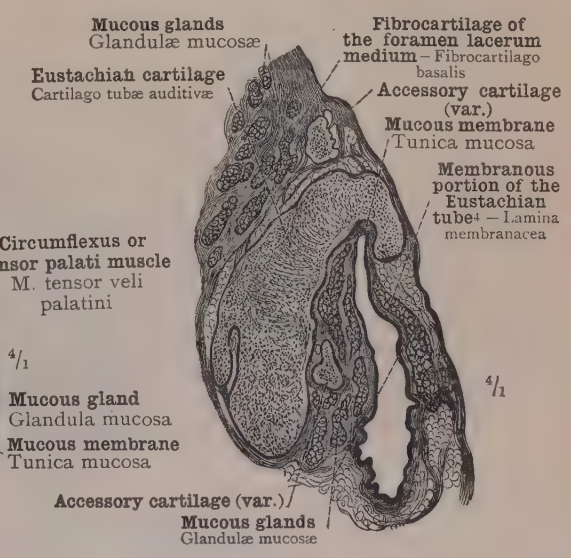


FIG. 1439.—NEAR THE PHARYNGEAL ORIFICE.

TRANSVERSE SECTIONS OF THE CARTILAGINOUS PORTION OF THE EUSTACHIAN TUBE, PARS CARTILAGINEA TUBÆ AUDITIVÆ.

[1] See Appendix, note 526. [2] See Appendix, note 528. [3] See Appendix, note 521. [4] See Appendix, note 526.

Auris media—The middle ear.—Tuba auditiva—The Eustachian tube.

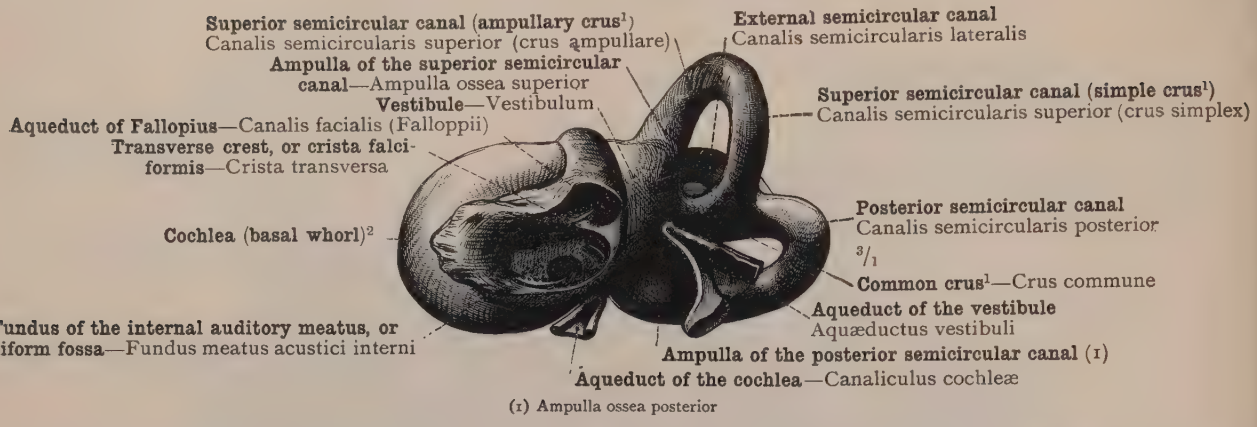

Superior semicircular canal (ampullary crus[1])
Canalis semicircularis superior (crus ampullare)
Ampulla of the superior semicircular canal—Ampulla ossea superior
Vestibule—Vestibulum
Aqueduct of Fallopius—Canalis facialis (Falloppii)
Transverse crest, or crista falciformis—Crista transversa
Cochlea (basal whorl)[2]
Fundus of the internal auditory meatus, or reniform fossa—Fundus meatus acustici interni
External semicircular canal
Canalis semicircularis lateralis
Superior semicircular canal (simple crus[1])
Canalis semicircularis superior (crus simplex)
Posterior semicircular canal
Canalis semicircularis posterior
3/1
Common crus[1]—Crus commune
Aqueduct of the vestibule
Aquæductus vestibuli
Ampulla of the posterior semicircular canal (1)
Aqueduct of the cochlea—Canaliculus cochleæ
(1) Ampulla ossea posterior

FIG. 1440.—THE OSSEOUS LABYRINTH, LABYRINTHUS OSSEUS, OF THE RIGHT EAR, WITH THE INTERNAL AUDITORY MEATUS, SEEN FROM BEHIND. THE AQUEDUCT OF THE VESTIBULE, AQUEDUCTUS VESTIBULI, AND THE AQUEDUCT OF THE COCHLEA, CANALICULUS COCHLEÆ.

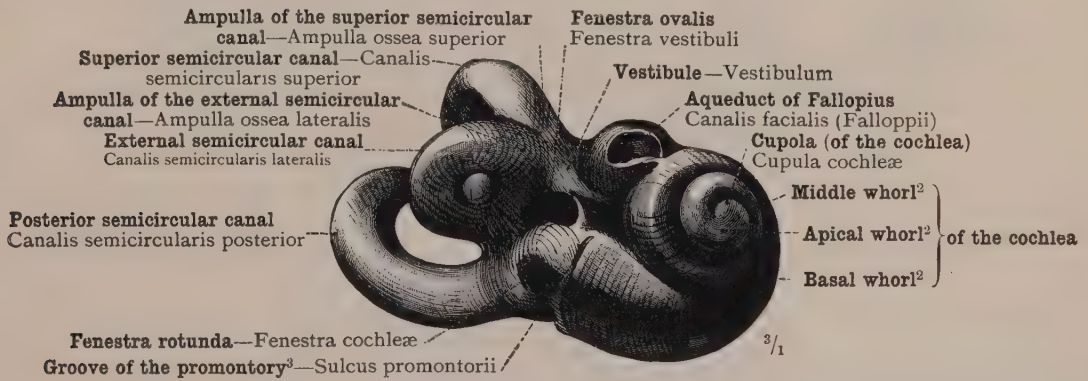


FIG. 1441.—THE OSSEOUS LABYRINTH OF THE RIGHT EAR, SEEN FROM BEFORE. THE FENESTRA OVALIS (FENESTRA VESTIBULI) AND THE FENESTRA ROTUNDA (FENESTRA COCHLEÆ); THE PART OF THE AQUEDUCT OF FALLOPIUS (CANALIS FACIALIS FALLOPPII) ADJACENT TO THE COCHLEA.

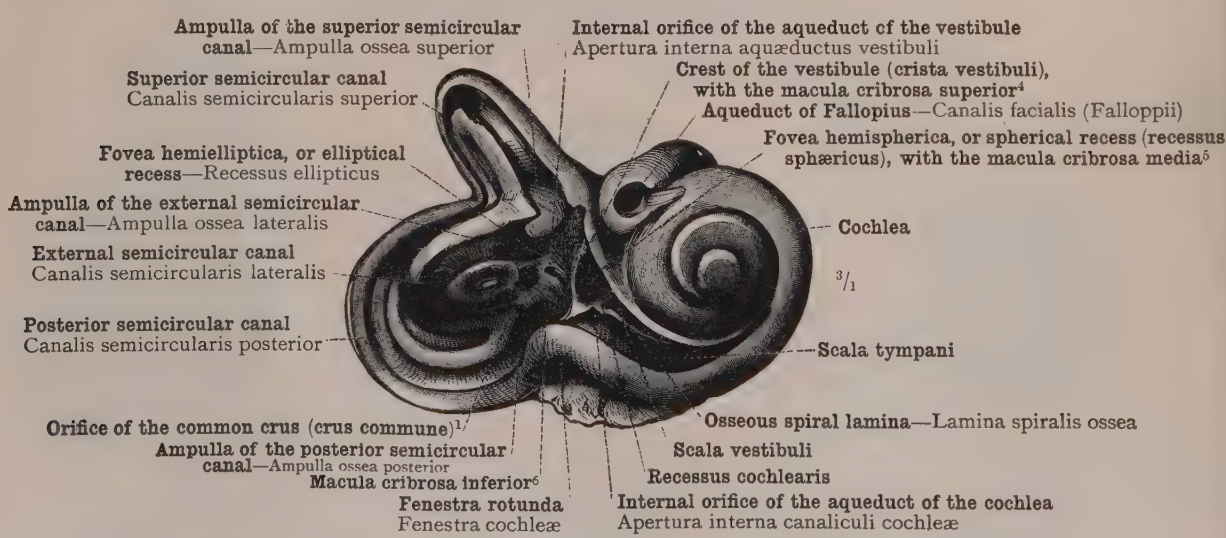

Ampulla of the superior semicircular canal—Ampulla ossea superior
Superior semicircular canal
Canalis semicircularis superior
Fovea hemielliptica, or elliptical recess—Recessus ellipticus
Ampulla of the external semicircular canal—Ampulla ossea lateralis
External semicircular canal
Canalis semicircularis lateralis
Posterior semicircular canal
Canalis semicircularis posterior
Orifice of the common crus (crus commune)[1]
Ampulla of the posterior semicircular canal—Ampulla ossea posterior
Macula cribrosa inferior[6]
Fenestra rotunda
Fenestra cochleæ
Internal orifice of the aqueduct of the vestibule
Apertura interna aquæductus vestibuli
Crest of the vestibule (crista vestibuli), with the macula cribrosa superior[4]
Aqueduct of Fallopius—Canalis facialis (Falloppii)
Fovea hemispherica, or spherical recess (recessus sphæricus), with the macula cribrosa media[5]
Cochlea
3/1
Scala tympani
Osseous spiral lamina—Lamina spiralis ossea
Scala vestibuli
Recessus cochlearis
Internal orifice of the aqueduct of the cochlea
Apertura interna canaliculi cochleæ

FIG. 1442.—THE OSSEOUS LABYRINTH OF THE RIGHT EAR, SEEN FROM BEFORE. THE OUTER WALL OF THE VESTIBULE HAS BEEN REMOVED, AND THE SEMICIRCULAR CANALS HAVE BEEN OPENED THROUGHOUT THEIR ENTIRE LENGTH. INNER SURFACE OF THE INNER AND POSTERIOR WALLS OF THE VESTIBULE, AND THE ORIFICES OF THE SEMICIRCULAR CANALS.

[1] See Appendix, note 529. [2] See Appendix, note 530. [3] See Appendix, note 525.
[4] See Appendix, note 531. [5] See Appendix, note 532. [6] See Appendix, note 533.

Auris interna—The internal ear.—Labyrinthus osseus—The osseous labyrinth.

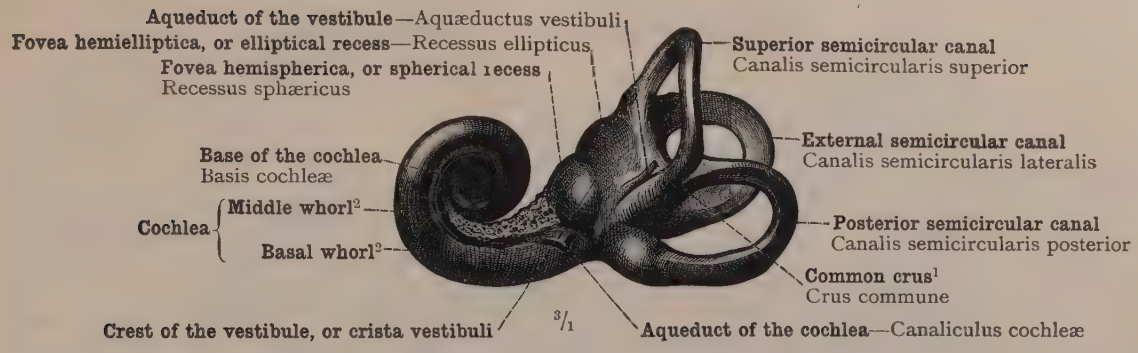


FIG. 1443.—CAST OF THE INTERIOR OF THE RIGHT OSSEOUS LABYRINTH, TAKEN WITH FUSIBLE METAL. SEEN FROM BEHIND.

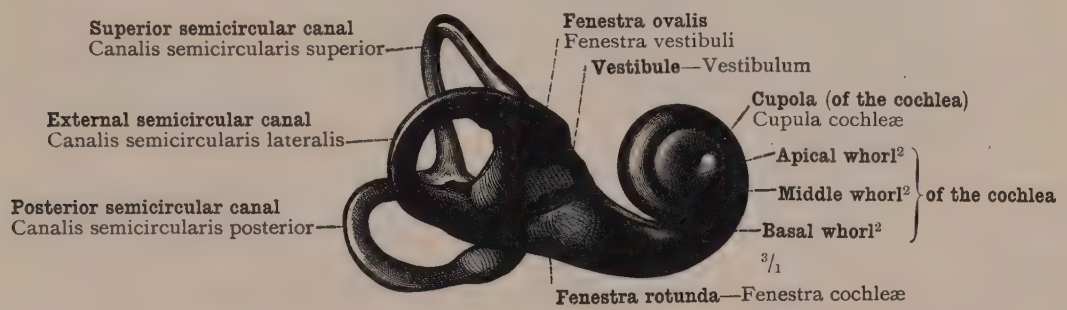


FIG. 1444.—CAST OF THE INTERIOR OF THE RIGHT OSSEOUS LABYRINTH, TAKEN WITH FUSIBLE METAL. SEEN FROM BEFORE.

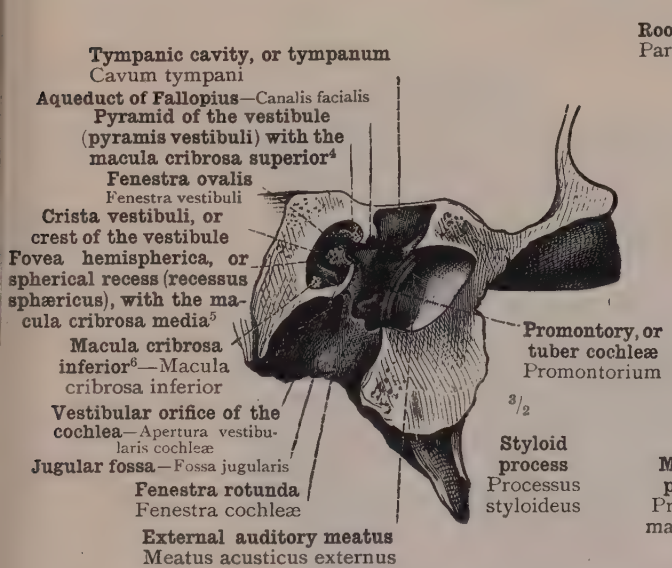

Tympanic cavity, or tympanum
Cavum tympani
Aqueduct of Fallopius—Canalis facialis
Pyramid of the vestibule (pyramis vestibuli) with the macula cribrosa superior⁴
Fenestra ovalis
Fenestra vestibuli
Crista vestibuli, or crest of the vestibule
Fovea hemispherica, or spherical recess (recessus sphæricus), with the macula cribrosa media⁵
Macula cribrosa inferior⁶—Macula cribrosa inferior
Vestibular orifice of the cochlea—Apertura vestibularis cochleæ
Jugular fossa—Fossa jugularis
Fenestra rotunda
Fenestra cochleæ
External auditory meatus
Meatus acusticus externus
Promontory, or tuber cochleæ
Promontorium
3/2
Styloid process
Processus styloideus

FIG. 1445.—ANTERIOR SEGMENT OF THE TEMPORAL BONE, WITH THE ANTERIOR PORTION OF THE VESTIBULE. THE MACULÆ CRIBROSÆ (*see Appendix, notes* 531, 532, *and* 533); THE VESTIBULAR ORIFICE OF THE COCHLEA.

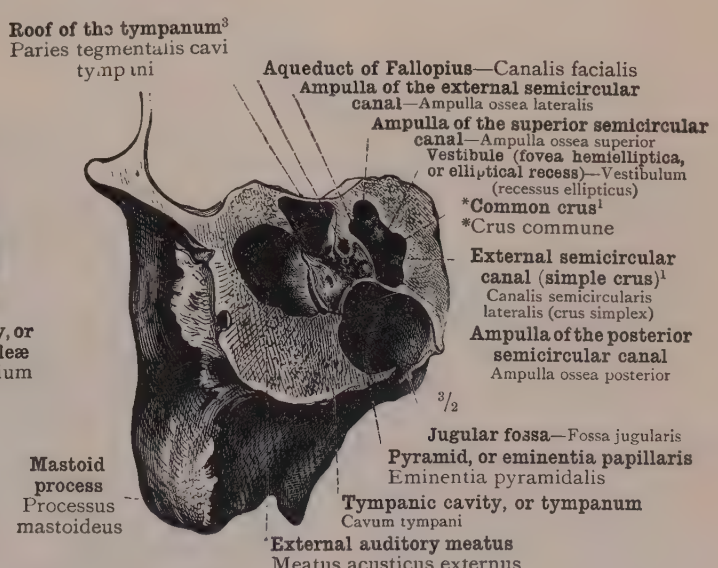


FIG. 1446.—POSTERIOR SEGMENT OF THE TEMPORAL BONE, WITH THE POSTERIOR PORTION OF THE VESTIBULE. THE ORIFICES OF THE SEMICIRCULAR CANALS.

A right temporal bone was divided by a frontal saw-cut, which cut transversely across the promontory or tuber cochleæ, the fenestra ovalis, and the vestibule of the labyrinth. The bone was thus divided into anterior and posterior segments.

1 See Appendix, note 529. 2 See Appendix, note 530. 3 See Appendix, note 522.
4 See Appendix, note 531. 5 See Appendix, note 532. 6 See Appendix, note 533.

Auris interna—The internal ear.—Labyrinthus osseus—The osseous labyrinth.

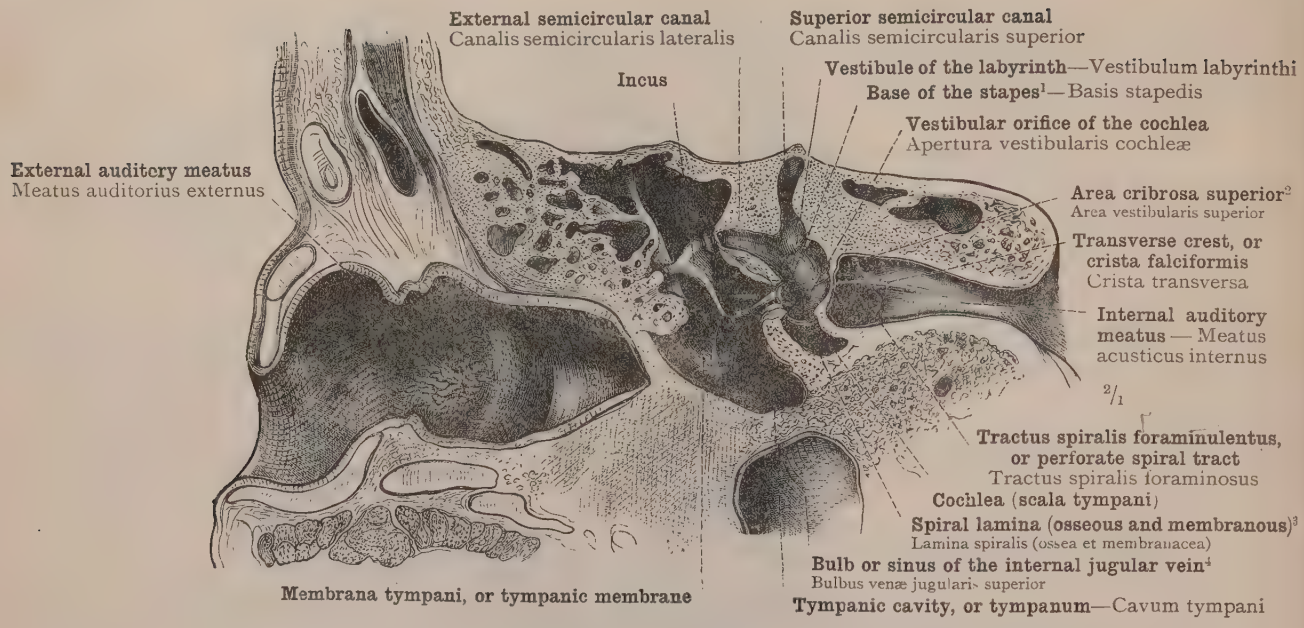

External semicircular canal
Canalis semicircularis lateralis
Superior semicircular canal
Canalis semicircularis superior
Incus
Vestibule of the labyrinth—Vestibulum labyrinthi
Base of the stapes[1]—Basis stapedis
Vestibular orifice of the cochlea
Apertura vestibularis cochleæ
External auditory meatus
Meatus auditorius externus
Area cribrosa superior[2]
Area vestibularis superior
Transverse crest, or crista falciformis
Crista transversa
Internal auditory meatus — Meatus acusticus internus
2/1
Tractus spiralis foraminulentus, or perforate spiral tract
Tractus spiralis foraminosus
Cochlea (scala tympani)
Spiral lamina (osseous and membranous)[3]
Lamina spiralis (ossea et membranacea)
Bulb or sinus of the internal jugular vein[4]
Bulbus venæ jugularis superior
Membrana tympani, or tympanic membrane
Tympanic cavity, or tympanum—Cavum tympani

FIG. 1447.—THE VESTIBULE OF THE LABYRINTH, SHOWN IN RELATION TO THE TYMPANIC CAVITY OR TYMPANUM AND TO THE FUNDUS OF THE INTERNAL AUDITORY MEATUS OR RENIFORM FOSSA.

A section, nearly coronal in direction, was made through the left organ of hearing, dividing the external and the internal auditory meatus in the direction of the long axis of these canals. The anterior segment seen from behind.

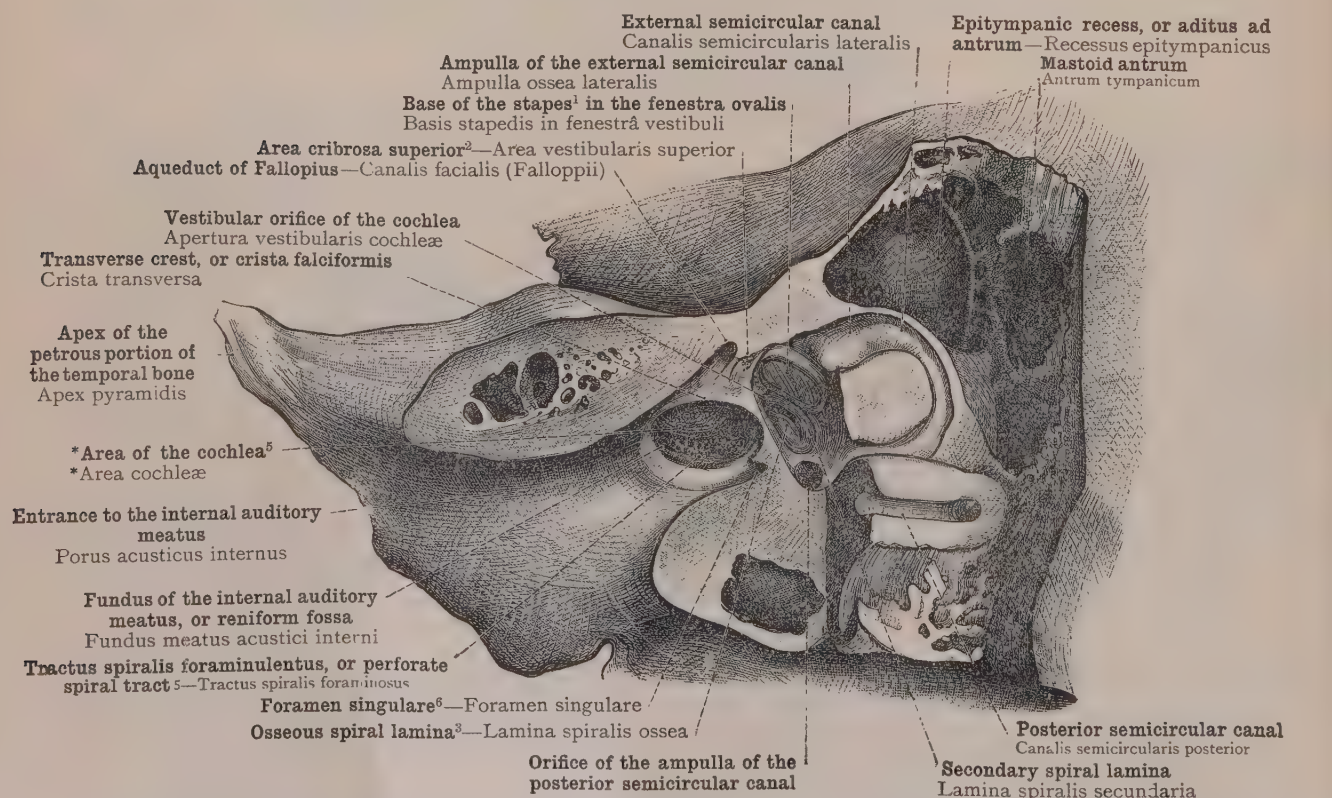

External semicircular canal
Canalis semicircularis lateralis
Epitympanic recess, or aditus ad antrum—Recessus epitympanicus
Ampulla of the external semicircular canal
Ampulla ossea lateralis
Mastoid antrum
Antrum tympanicum
Base of the stapes[1] in the fenestra ovalis
Basis stapedis in fenestrâ vestibuli
Area cribrosa superior[2]—Area vestibularis superior
Aqueduct of Fallopius—Canalis facialis (Falloppii)
Vestibular orifice of the cochlea
Apertura vestibularis cochleæ
Transverse crest, or crista falciformis
Crista transversa
Apex of the petrous portion of the temporal bone
Apex pyramidis
*Area of the cochlea[5]
*Area cochleæ
Entrance to the internal auditory meatus
Porus acusticus internus
Fundus of the internal auditory meatus, or reniform fossa
Fundus meatus acustici interni
Tractus spiralis foraminulentus, or perforate spiral tract 5—Tractus spiralis foraminosus
Foramen singulare[6]—Foramen singulare
Osseous spiral lamina[3]—Lamina spiralis ossea
Orifice of the ampulla of the posterior semicircular canal
Posterior semicircular canal
Canalis semicircularis posterior
Secondary spiral lamina
Lamina spiralis secundaria

FIG. 1448.—THE VESTIBULE OF THE LABYRINTH WITH THE EXTERNAL SEMICIRCULAR CANAL, THE UPPER LIMB (*CRUS SIMPLEX—*see Appendix, note* 529) OF THE POSTERIOR SEMICIRCULAR CANAL, AND THE INTERNAL AUDITORY MEATUS, EXPOSED FROM ABOVE IN THE PETROUS PORTION OF THE RIGHT TEMPORAL BONE. SEEN OBLIQUELY FROM ABOVE AND BEHIND.

[1] Also called the *basal plate*, or *foot-plate*, of the stapes. [2] See Appendix, note 531.
[3] The Latin names, *lamina spiralis ossea* and *lamina spiralis membranacea*, are also quite commonly used in England.
[4] See Appendix to Part V., note 121. [5] See Appendix, note 534. [6] See Appendix, note 533

Auris interna—The internal ear.—Labyrinthus osseus—The osseous labyrinth.

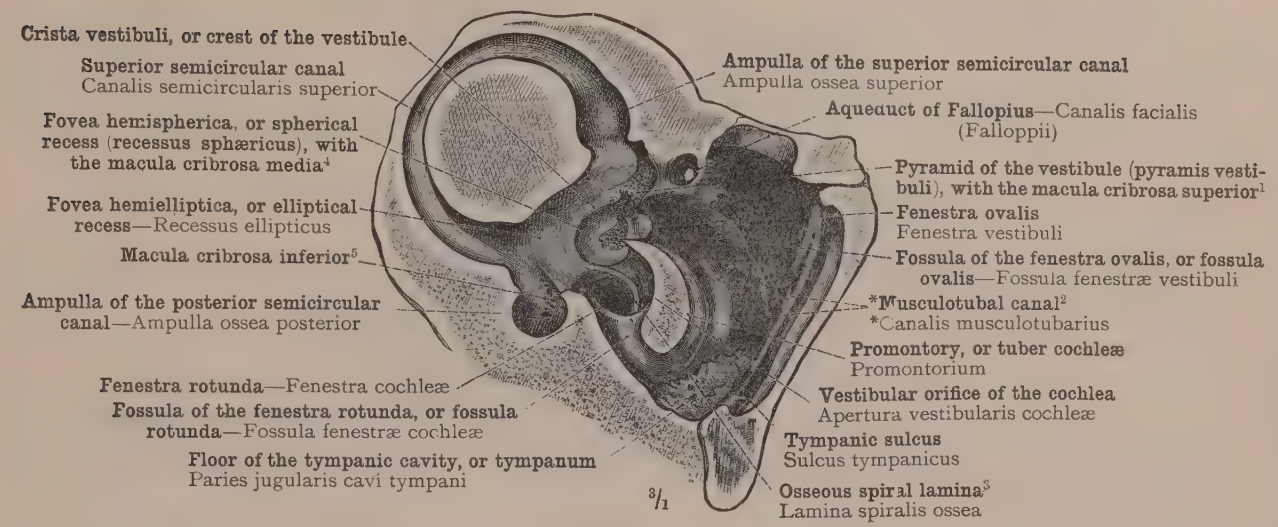
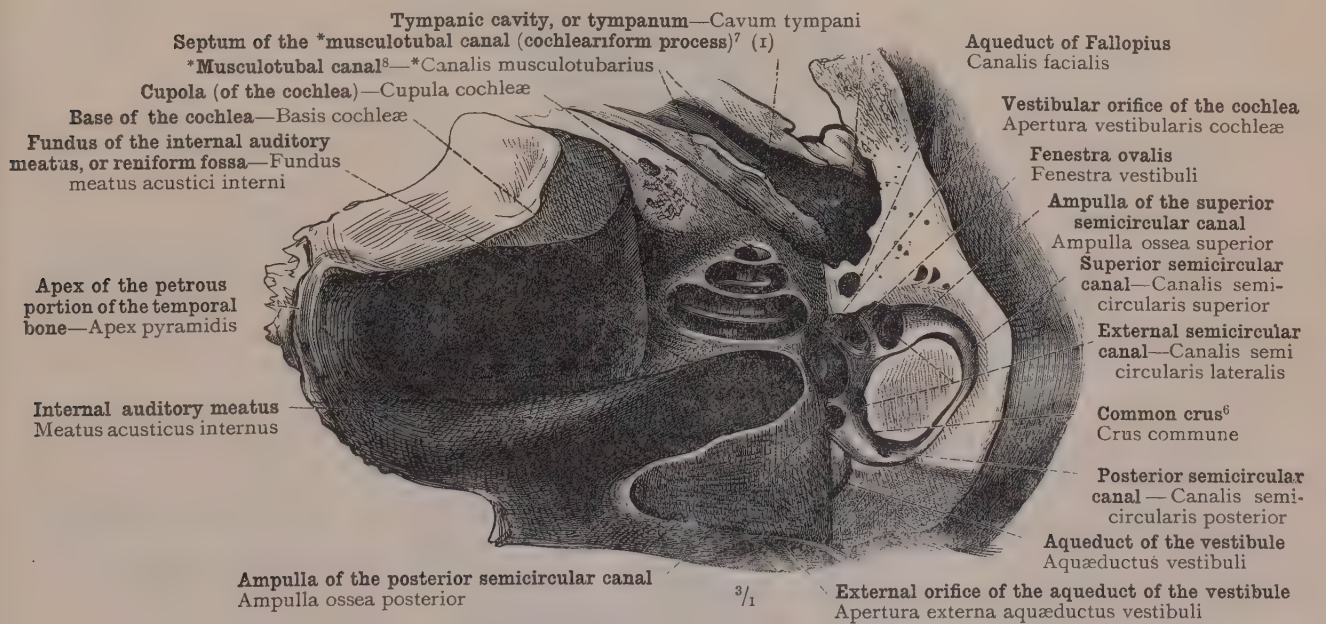

Crista vestibuli, or crest of the vestibule
Superior semicircular canal
Canalis semicircularis superior
Fovea hemispherica, or spherical recess (recessus sphæricus), with the macula cribrosa media[4]
Fovea hemielliptica, or elliptical recess—Recessus ellipticus
Macula cribrosa inferior[5]
Ampulla of the posterior semicircular canal—Ampulla ossea posterior
Fenestra rotunda—Fenestra cochleæ
Fossula of the fenestra rotunda, or fossula rotunda—Fossula fenestræ cochleæ
Floor of the tympanic cavity, or tympanum
Paries jugularis cavi tympani
Ampulla of the superior semicircular canal
Ampulla ossea superior
Aqueduct of Fallopius—Canalis facialis (Falloppii)
Pyramid of the vestibule (pyramis vestibuli), with the macula cribrosa superior[1]
Fenestra ovalis
Fenestra vestibuli
Fossula of the fenestra ovalis, or fossula ovalis—Fossula fenestræ vestibuli
*Musculotubal canal[2]
*Canalis musculotubarius
Promontory, or tuber cochleæ
Promontorium
Vestibular orifice of the cochlea
Apertura vestibularis cochleæ
Tympanic sulcus
Sulcus tympanicus
Osseous spiral lamina[3]
Lamina spiralis ossea
3/1

FIG. 1449.—THE ANTERIOR PORTION OF THE VESTIBULE WITH THE SUPERIOR SEMICIRCULAR CANAL. IN THE VESTIBULE WE SEE THE MACULÆ CRIBROSÆ (*see Appendix, notes* 531, 532, *and* 533) AND THE VESTIBULAR ORIFICE OF THE COCHLEA.

The petrous portion of a right temporal bone was sawn across in a plane nearly perpendicular to its long axis in such a manner that the section cut the tympanum transversely and passed through the fenestra ovalis and the whole length of the superior semicircular canal. The inner segment of the petrous portion of the temporal bone is viewed from the outer side.


Tympanic cavity, or tympanum—Cavum tympani
Septum of the *musculotubal canal (cochleariform process)[7] (1)
*Musculotubal canal[8]—*Canalis musculotubarius
Cupola (of the cochlea)—Cupula cochleæ
Base of the cochlea—Basis cochleæ
Fundus of the internal auditory meatus, or reniform fossa—Fundus meatus acustici interni
Apex of the petrous portion of the temporal bone—Apex pyramidis
Internal auditory meatus
Meatus acusticus internus
Ampulla of the posterior semicircular canal
Ampulla ossea posterior
Aqueduct of Fallopius
Canalis facialis
Vestibular orifice of the cochlea
Apertura vestibularis cochleæ
Fenestra ovalis
Fenestra vestibuli
Ampulla of the superior semicircular canal
Ampulla ossea superior
Superior semicircular canal—Canalis semicircularis superior
External semicircular canal—Canalis semicircularis lateralis
Common crus[6]
Crus commune
Posterior semicircular canal—Canalis semicircularis posterior
Aqueduct of the vestibule
Aquæductus vestibuli
External orifice of the aqueduct of the vestibule
Apertura externa aquæductus vestibuli
3/1

(1) Septum canalis musculotubarii

FIG. 1450.—THE RELATION OF THE VESTIBULE TO THE COCHLEA AND OF THIS LATTER TO THE FUNDUS OF THE INTERNAL AUDITORY MEATUS OR RENIFORM FOSSA AND TO THE *MUSCULOTUBAL CANAL (*i.e.*, THE CANAL FOR THE TENSOR TYMPANI MUSCLE AND THE OSSEOUS CANAL FOR THE EUSTACHIAN TUBE—*see Appendix, note* 528), *CANALIS MUSCULOTUBARIUS, DISPLAYED FROM ABOVE IN A RIGHT TEMPORAL BONE.

The superior semicircular canal is opened throughout its whole length, and a portion of the aqueduct of the vestibule, aquæductus vestibuli, is also exposed.

1 See Appendix, note 531. 2 See Appendix, note 528. 3 See note 3 to p. 932. 4 See Appendix, note 532.
5 See Appendix, note 533. 6 See Appendix, note 529. 7 See Appendix, notes 524 and 528. 8 See Appendix, note 528.

Auris interna—The internal ear.—Labyrinthus osseus—The osseous labyrinth.

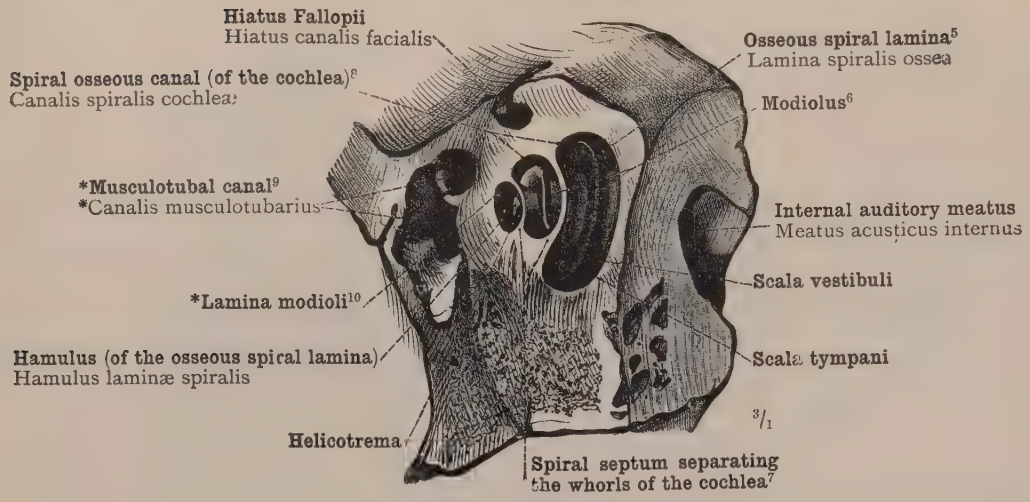


FIG. 1451.—THE (OSSEOUS) COCHLEA, DIVIDED IN A PLANE PARALLEL TO ITS LONG AXIS. ITS RELATION TO THE *MUSCULOTUBAL CANAL (*i.e.*, THE CANAL FOR THE TENSOR TYMPANI MUSCLE AND THE OSSEOUS CANAL FOR THE EUSTACHIAN TUBE—*see Appendix, note* [528]), *CANALIS MUSCULOTUBARIUS. INNER SURFACE OF THE OUTER SEGMENT.

Displayed by a saw-cut in a plane perpendicular to the long axis of the petrous portion of the right temporal bone.

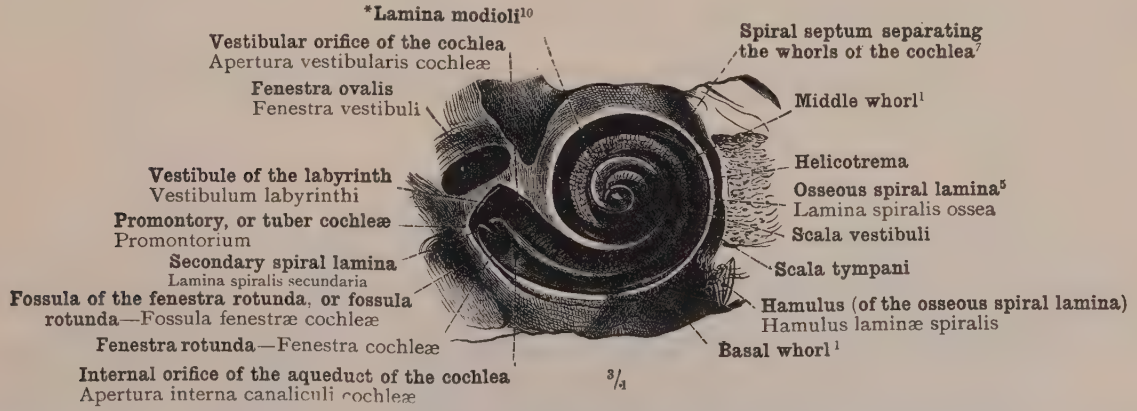


FIG. 1452.—THE (OSSEOUS) COCHLEA OF THE RIGHT EAR, DISPLAYED FROM BEFORE BY THE REMOVAL OF THE CAROTID CANAL, CANALIS CAROTICUS, AND OF THE *MUSCULOTUBAL CANAL (*i.e.*, THE CANAL FOR THE TENSOR TYMPANI MUSCLE AND THE OSSEOUS CANAL FOR THE EUSTACHIAN TUBE—*see Appendix, note* [528]), *CANALIS MUSCULOTUBARIUS. THE WHORLS OF THE COCHLEA (*see Appendix, note* [530]), OPENED BY THE REMOVAL OF THE OUTER WALL OF THAT ORGAN, ARE VIEWED FROM THE DIRECTION OF THE APEX OF THE COCHLEA —THAT IS, FROM ABOVE AND THE OUTER SIDE.

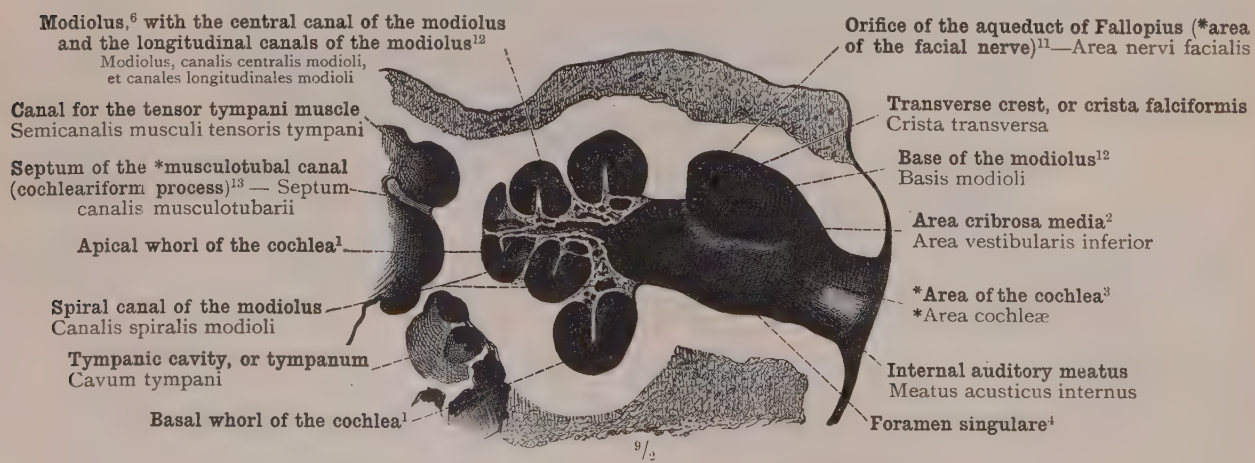

Modiolus,[6] with the central canal of the modiolus and the longitudinal canals of the modiolus[12]
Modiolus, canalis centralis modioli, et canales longitudinales modioli
Canal for the tensor tympani muscle
Semicanalis musculi tensoris tympani
Septum of the *musculotubal canal (cochleariform process)[13] — Septum canalis musculotubarii
Apical whorl of the cochlea[1]
Spiral canal of the modiolus
Canalis spiralis modioli
Tympanic cavity, or tympanum
Cavum tympani
Basal whorl of the cochlea[1]
Orifice of the aqueduct of Fallopius (*area of the facial nerve)[11]—Area nervi facialis
Transverse crest, or crista falciformis
Crista transversa
Base of the modiolus[12]
Basis modioli
Area cribrosa media[2]
Area vestibularis inferior
*Area of the cochlea[3]
*Area cochleæ
Internal auditory meatus
Meatus acusticus internus
Foramen singulare[4]
9/2

FIG. 1453.—AXIAL SECTION THROUGH THE (OSSEOUS) COCHLEA OF THE RIGHT EAR. THE MODIOLUS[6] IS DIVIDED THROUGHOUT ITS WHOLE LENGTH.

[1] See Appendix, note 530. [2] See Appendix, note 532. [3] See Appendix, note 534. [4] See Appendix, note 533.
[5] See note 3 to p. 932. [6] The *modiolus*, the central pillar or axis of the cochlea, is also known as the *columella cochleæ*
[7] See Appendix, note 535. [8] See Appendix, note 536. [9] See Appendix, note 528. [10] See Appendix, note 537.
[11] See Appendix, note 538 [12] See Appendix, note 539. [13] See Appendix, note 540.

Auris interna—The internal ear.—Labyrinthus osseus—The osseous labyrinth.

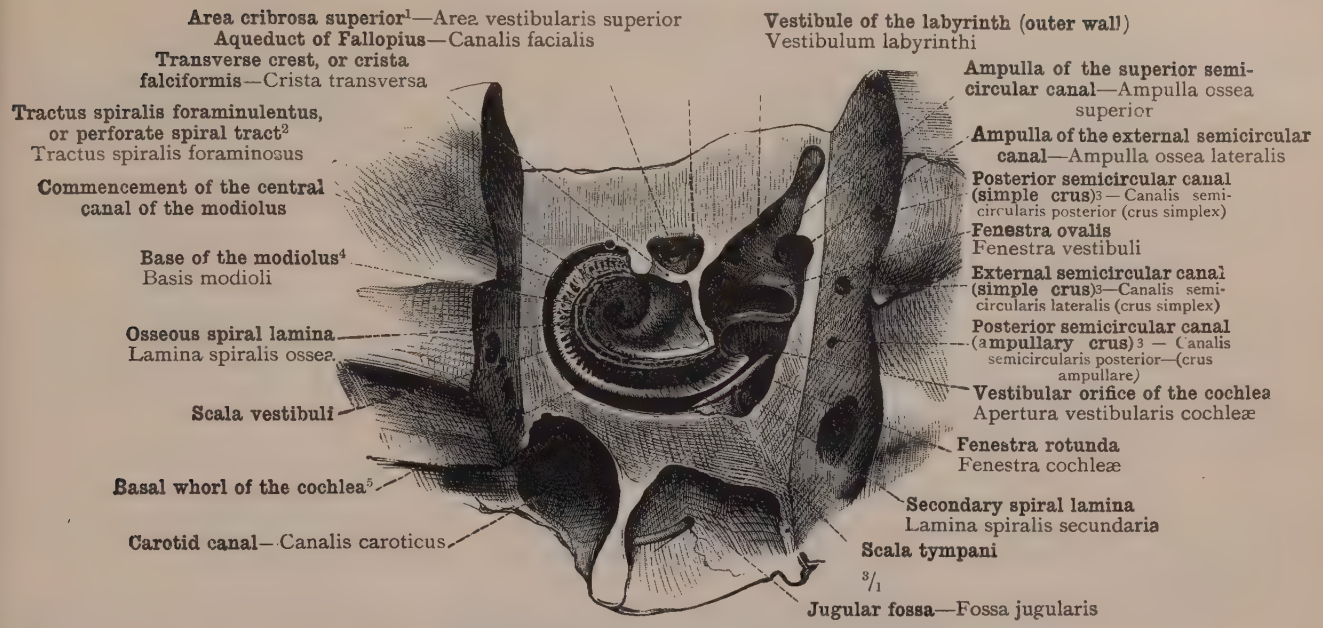

Area cribrosa superior[1]—Area vestibularis superior
Aqueduct of Fallopius—Canalis facialis
Transverse crest, or crista falciformis—Crista transversa
Tractus spiralis foraminulentus, or perforate spiral tract[2]
Tractus spiralis foraminosus
Commencement of the central canal of the modiolus
Base of the modiolus[4]
Basis modioli
Osseous spiral lamina
Lamina spiralis ossea
Scala vestibuli
Basal whorl of the cochlea[5]
Carotid canal—Canalis caroticus
Vestibule of the labyrinth (outer wall)
Vestibulum labyrinthi
Ampulla of the superior semicircular canal—Ampulla ossea superior
Ampulla of the external semicircular canal—Ampulla ossea lateralis
Posterior semicircular canal (simple crus)[3]—Canalis semicircularis posterior (crus simplex)
Fenestra ovalis
Fenestra vestibuli
External semicircular canal (simple crus)[3]—Canalis semicircularis lateralis (crus simplex)
Posterior semicircular canal (ampullary crus)[3]—Canalis semicircularis posterior—(crus ampullare)
Vestibular orifice of the cochlea
Apertura vestibularis cochleæ
Fenestra rotunda
Fenestra cochleæ
Secondary spiral lamina
Lamina spiralis secundaria
Scala tympani
3/1
Jugular fossa—Fossa jugularis

FIG. 1454.—THE BASAL WHORL OF THE COCHLEA (*see Appendix, note* [530]) WITH THE BASE OF THE MODIOLUS, BASIS MODIOLI (*see Appendix, note* [539]), SEEN FROM BEHIND. THE OSSEOUS SPIRAL LAMINA, LAMINA SPIRALIS OSSEA, BY MEANS OF WHICH THE SCALA VESTIBULI IS [IN PART] SEPARATED FROM THE SCALA TYMPANI, IS SEEN FROM THE BASAL SIDE OF THE COCHLEA [THAT IS, FROM BELOW, ACCORDING TO THE CONVENTIONAL DESCRIPTION OF THE COCHLEA—*see Appendix, note* [540]]. THE OPENING OF THE SCALA VESTIBULI INTO THE VESTIBULE (VESTIBULAR ORIFICE OF THE COCHLEA, APERTURA VESTIBULARIS COCHLEÆ), AND THE OPENING OF THE SCALA TYMPANI INTO THE TYMPANUM OR TYMPANIC CAVITY BY MEANS OF THE FENESTRA ROTUNDA (CLOSED IN THE RECENT STATE BY THE SECONDARY TYMPANIC MEMBRANE OR MEMBRANE OF THE FENESTRA ROTUNDA—*see Appendix, note* [523]). DISPLAYED FROM BEHIND IN THE PETROUS PORTION OF THE RIGHT TEMPORAL BONE.

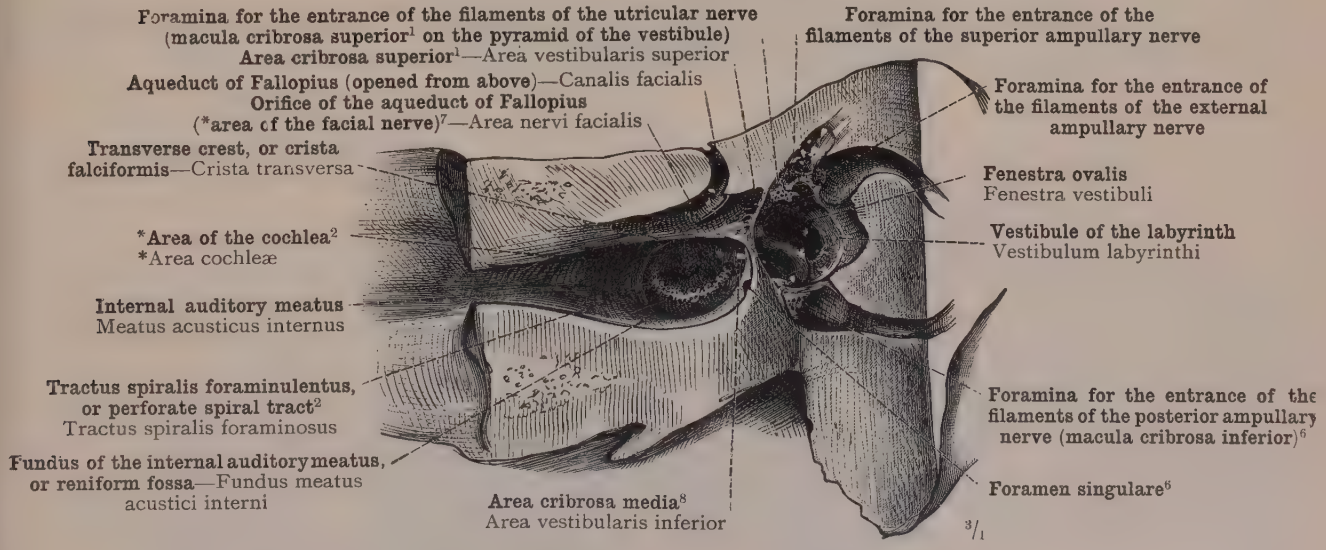

Foramina for the entrance of the filaments of the utricular nerve (macula cribrosa superior[1] on the pyramid of the vestibule)
Area cribrosa superior[1]—Area vestibularis superior
Aqueduct of Fallopius (opened from above)—Canalis facialis
Orifice of the aqueduct of Fallopius (*area of the facial nerve)[7]—Area nervi facialis
Transverse crest, or crista falciformis—Crista transversa
*Area of the cochlea[2]
*Area cochleæ
Internal auditory meatus
Meatus acusticus internus
Tractus spiralis foraminulentus, or perforate spiral tract[2]
Tractus spiralis foraminosus
Fundus of the internal auditory meatus, or reniform fossa—Fundus meatus acustici interni
Area cribrosa media[8]
Area vestibularis inferior
Foramina for the entrance of the filaments of the superior ampullary nerve
Foramina for the entrance of the filaments of the external ampullary nerve
Fenestra ovalis
Fenestra vestibuli
Vestibule of the labyrinth
Vestibulum labyrinthi
Foramina for the entrance of the filaments of the posterior ampullary nerve (macula cribrosa inferior)[6]
Foramen singulare[6]
3/1

FIG. 1455.—THE INTERNAL AUDITORY MEATUS, MEATUS ACUSTICUS INTERNUS, OPENED FROM BEHIND IN THE PETROUS PORTION OF THE RIGHT TEMPORAL BONE. IN THE FUNDUS OF THE INTERNAL AUDITORY MEATUS, OR RENIFORM FOSSA, WE SEE THE TRACTUS SPIRALIS FORAMINULENTUS, OR PERFORATE SPIRAL TRACT (TRACTUS SPIRALIS FORAMINOSUS, ACCORDING TO TOLDT[9]), AND THE ORIFICES OF THE NERVE CANALICULI LEADING INTO THE MODIOLUS AND THE OSSEOUS SPIRAL LAMINA, AND ALSO THE ORIFICES OF THE NERVE CANALICULI LEADING TO THE MACULÆ CRIBROSÆ OF THE VESTIBULE AND TO THE AMPULLÆ OF THE SEMICIRCULAR CANALS (*see Appendix, notes* [531], [532], [533], *and* [531]). IN THE VESTIBULE, LIKEWISE OPENED FROM BEHIND, WE SEE THE MACULÆ CRIBROSÆ, SUPERIOR ET INFERIOR, AND THE FORAMINA FOR THE ENTRANCE OF THE FILAMENTS OF THE SUPERIOR AND EXTERNAL AMPULLARY NERVES.

1 See Appendix, note [531]. 2 See Appendix, note [534]. 3 See Appendix, note [529].
4 See Appendix, note [539]. 5 See Appendix, note [530]. 6 See Appendix, note [533].
7 See Appendix, note [538]. 8 See Appendix, note [532]. 9 See Appendix, note [541].

Auris interna—The internal ear.—**Labyrinthus osseus**—The osseous labyrinth.

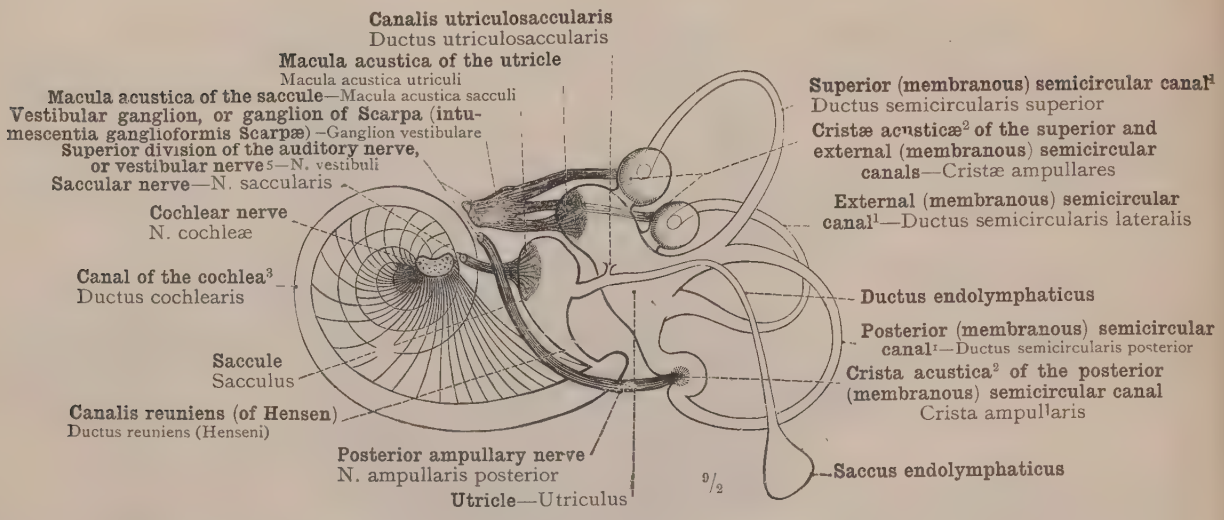


FIG. 1456.—DIAGRAMMATIC REPRESENTATION OF THE RIGHT MEMBRANOUS LABYRINTH AND THE DISTRIBUTION OF THE RIGHT AUDITORY NERVE, NERVUS ACUSTICUS. SEEN FROM BEHIND.

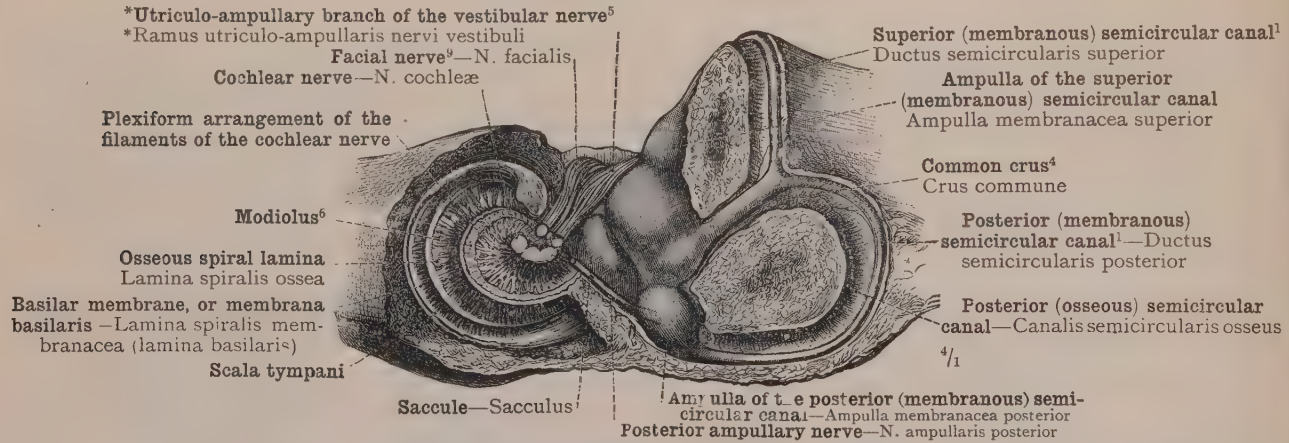

*Utriculo-ampullary branch of the vestibular nerve[5]
*Ramus utriculo-ampullaris nervi vestibuli
Facial nerve[9]—N. facialis
Cochlear nerve—N. cochleæ
Plexiform arrangement of the filaments of the cochlear nerve
Modiolus[6]
Osseous spiral lamina
Lamina spiralis ossea
Basilar membrane, or membrana basilaris—Lamina spiralis membranacea (lamina basilaris)
Scala tympani
Saccule—Sacculus
Ampulla of the posterior (membranous) semicircular canal—Ampulla membranacea posterior
Posterior ampullary nerve—N. ampullaris posterior
Superior (membranous) semicircular canal[1]
Ductus semicircularis superior
Ampulla of the superior (membranous) semicircular canal
Ampulla membranacea superior
Common crus[4]
Crus commune
Posterior (membranous) semicircular canal[1]—Ductus semicircularis posterior
Posterior (osseous) semicircular canal—Canalis semicircularis osseus
4/1

FIG. 1457.—THE MEMBRANOUS LABYRINTH OF A NEW-BORN INFANT, DISPLAYED BY THE PARTIAL REMOVAL OF THE OSSEOUS LABYRINTH. RIGHT EAR. SEEN FROM BEHIND.

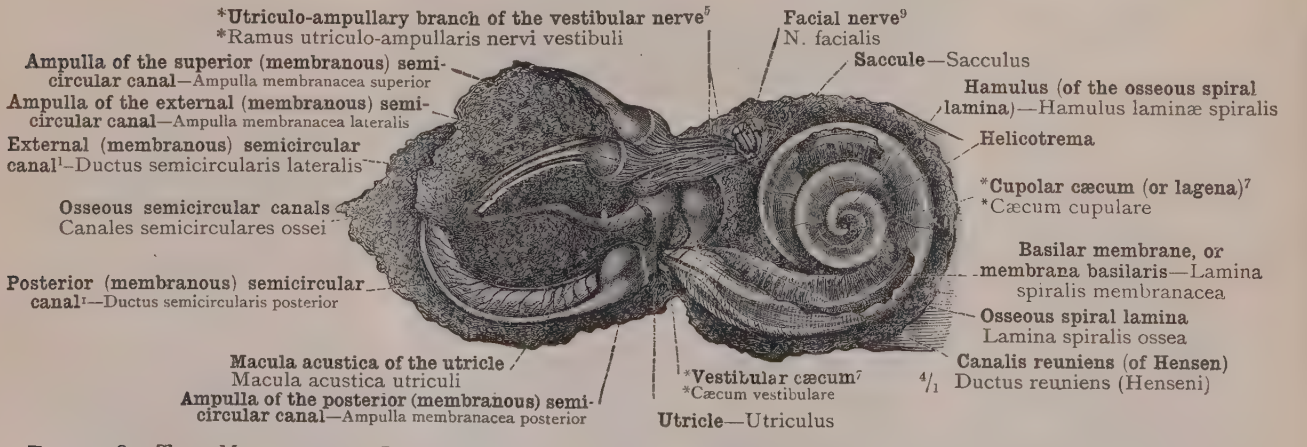

*Utriculo-ampullary branch of the vestibular nerve[7]
*Ramus utriculo-ampullaris nervi vestibuli
Facial nerve[9]
N. facialis
Saccule—Sacculus
Ampulla of the superior (membranous) semicircular canal—Ampulla membranacea superior
Ampulla of the external (membranous) semicircular canal—Ampulla membranacea lateralis
External (membranous) semicircular canal[1]—Ductus semicircularis lateralis
Hamulus (of the osseous spiral lamina)—Hamulus laminæ spiralis
Helicotrema
*Cupolar cæcum (or lagena)[7]
*Cæcum cupulare
Osseous semicircular canals
Canales semicirculares ossei
Basilar membrane, or membrana basilaris—Lamina spiralis membranacea
Posterior (membranous) semicircular canal[1]—Ductus semicircularis posterior
Osseous spiral lamina
Lamina spiralis ossea
Macula acustica of the utricle
Macula acustica utriculi
Ampulla of the posterior (membranous) semicircular canal—Ampulla membranacea posterior
*Vestibular cæcum[7]
*Cæcum vestibulare
Canalis reuniens (of Hensen)
Ductus reuniens (Henseni)
4/1
Utricle—Utriculus

FIG. 1458.—THE MEMBRANOUS LABYRINTH OF A NEW-BORN INFANT, SEEN FROM BEFORE. RIGHT EAR. THE WALL OF THE CAVITY OF THE COCHLEA (*see Appendix, note* 546) IS FORMED BY THE PERIOSTEAL INVESTMENT OF THE SPIRAL OSSEOUS CANAL OF THE COCHLEA (*see Appendix, note* 546) AND BY THE SPIRAL LIGAMENT, LIGAMENTUM SPIRALE.

[1] See Appendix, note 542. [2] See Appendix, note 543.
[3] Or, more briefly, the *cochlear canal*. Also known in England by the Latin names *canalis* (*membranaceus*) *cochleæ* and *ductus cochlearis*. It was formerly known as the *scala media*. See also Appendix, note 536.
[4] See Appendix, note 529. [5] See Appendix, note 544. [6] See note [6] to p. 934. [7] See Appendix, note 545.
[8] See Appendix, note 546. [9] See note [11] to p. 937.

Auris interna—The internal ear.—Labyrinthus membranaceus—The membranous labyrinth.

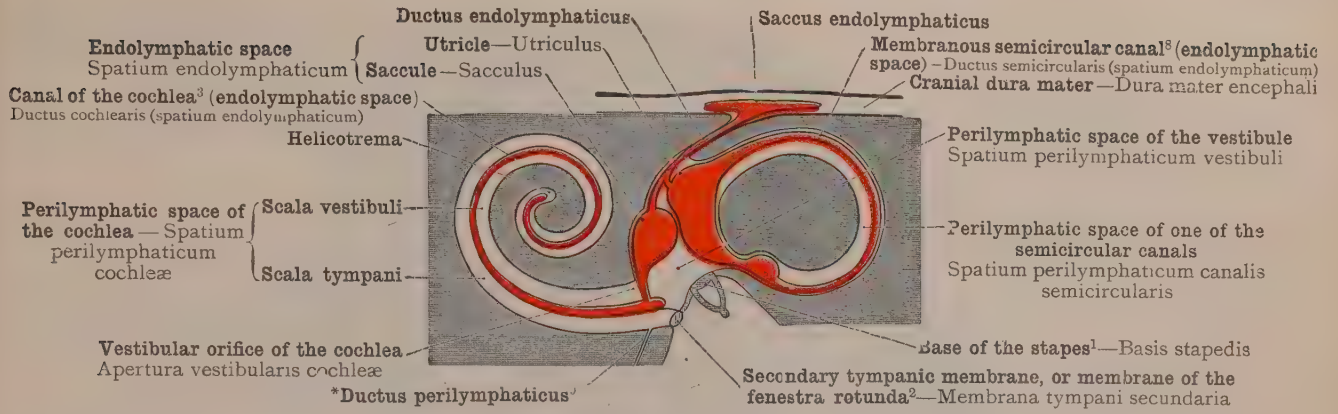

Ductus endolymphaticus
Saccus endolymphaticus
Endolymphatic space
Spatium endolymphaticum
Utricle—Utriculus
Saccule—Sacculus
Membranous semicircular canal[8] (endolymphatic space)—Ductus semicircularis (spatium endolymphaticum)
Cranial dura mater—Dura mater encephali
Canal of the cochlea[3] (endolymphatic space)
Ductus cochlearis (spatium endolymphaticum)
Helicotrema
Perilymphatic space of the vestibule
Spatium perilymphaticum vestibuli
Perilymphatic space of the cochlea—Spatium perilymphaticum cochleæ
Scala vestibuli
Scala tympani
Perilymphatic space of one of the semicircular canals
Spatium perilymphaticum canalis semicircularis
Vestibular orifice of the cochlea
Apertura vestibularis cochleæ
Base of the stapes[1]—Basis stapedis
*Ductus perilymphaticus
Secondary tympanic membrane, or membrane of the fenestra rotunda[2]—Membrana tympani secundaria

FIG. 1459.—DIAGRAM OF THE ENDOLYMPHATIC AND PERILYMPHATIC SPACES OF THE LABYRINTH (THE FORMER RED, THE LATTER WHITE).

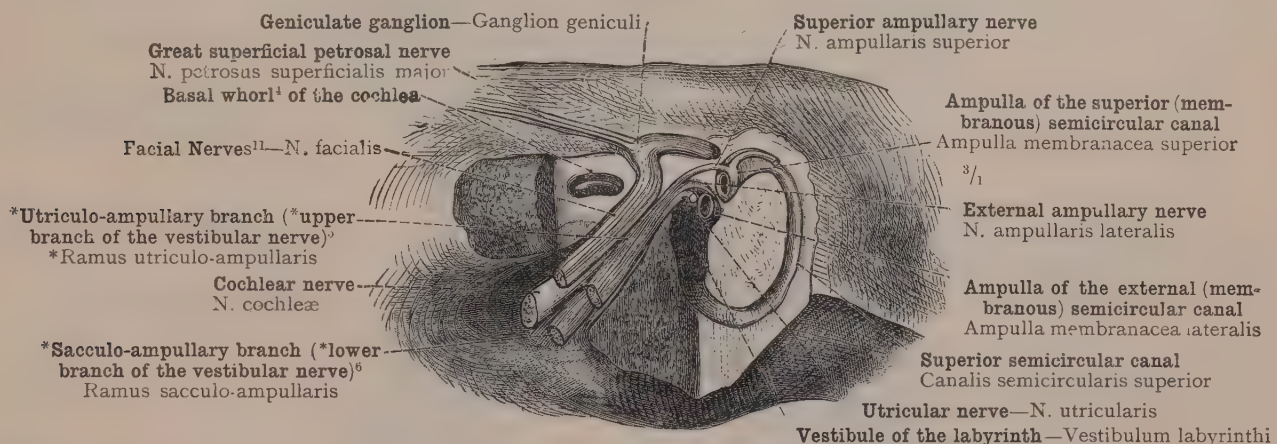


FIG. 1460.—THE FACIAL NERVE AND THE *UPPER OR *UTRICULO-AMPULLARY BRANCH, *RAMUS UTRICULO-AMPULLARIS, OF THE *VESTIBULAR NERVE, *NERVUS VESTIBULI,[5] DISPLAYED FROM ABOVE BY THE OPENING OF THE INTERNAL AUDITORY MEATUS.

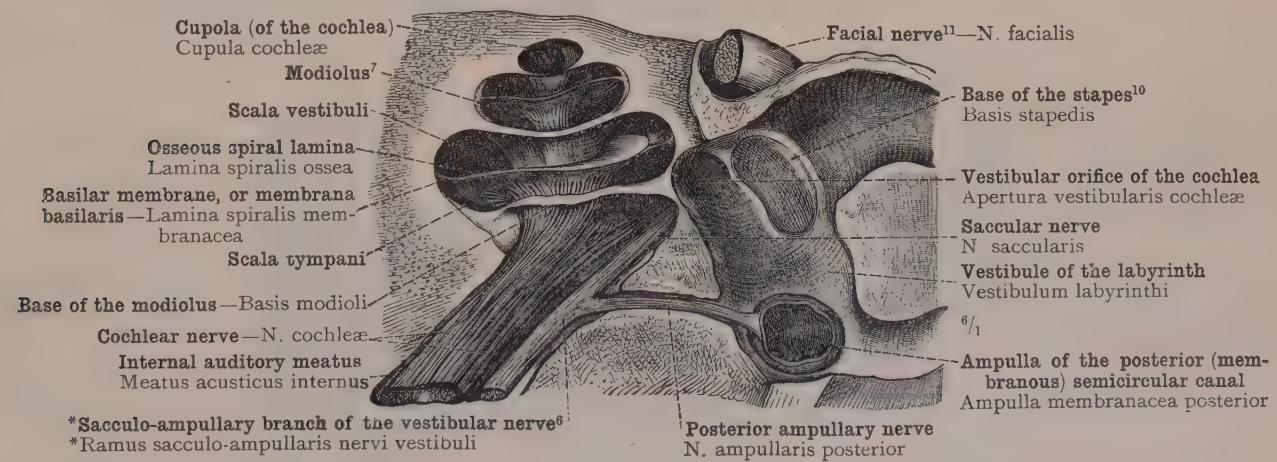


FIG. 1461.—THE COCHLEAR NERVE AND THE *LOWER OR *SACCULO-AMPULLARY BRANCH, RAMUS *SACCULO-AMPULLARIS,[6] OF THE *VESTIBULAR NERVE, *NERVUS VESTIBULARIS, DISPLAYED IN THE PREPARATION ALREADY DEPICTED IN FIG. 1460 BY THE REMOVAL OF THE FACIAL NERVE AND THE *UPPER BRANCH OF THE *VESTIBULAR NERVE.[5]

1 Known also as the *basal plate* or *foot-plate of the stapes.* 2 See Appendix, note 523.
3 Or, more briefly, the *cochlear canal.* Also known in England by the Latin names *canalis* (*membranaceus*) *cochleæ* and *ductus cochlearis.* It was formerly known as the *scala media.* See Appendix, note 536.
4 See Appendix, note 530.
5 This **utriculo-ampullary branch*, or so-called **upper branch of the vestibular nerve*, is itself the entire *vestibular nerve* in Quain's terminology. See Appendix, note 544.
6 This **sacculo-ampullary branch* represents the *posterior branch of the inferior division of the auditory nerve* in Quain's terminology. See Appendix, note 544.
7 Also known as the *columella cochleæ.* 8 See Appendix, note 542. 9 See Appendix, note 547.
10 Also known as the *foot-plate*, or *basal plate*, of the stapes.
11 In Soemmerring's enumeration the *facial* is the *seventh*, the *auditory* the *eighth cranial nerve;* in that of Willis the former is the *portio dura*, the latter the *portio mollis*, of the *seventh cranial nerve.*

Auris interna—The internal ear.—N. acusticus—The auditory nerve (*see note* 11 *above*).

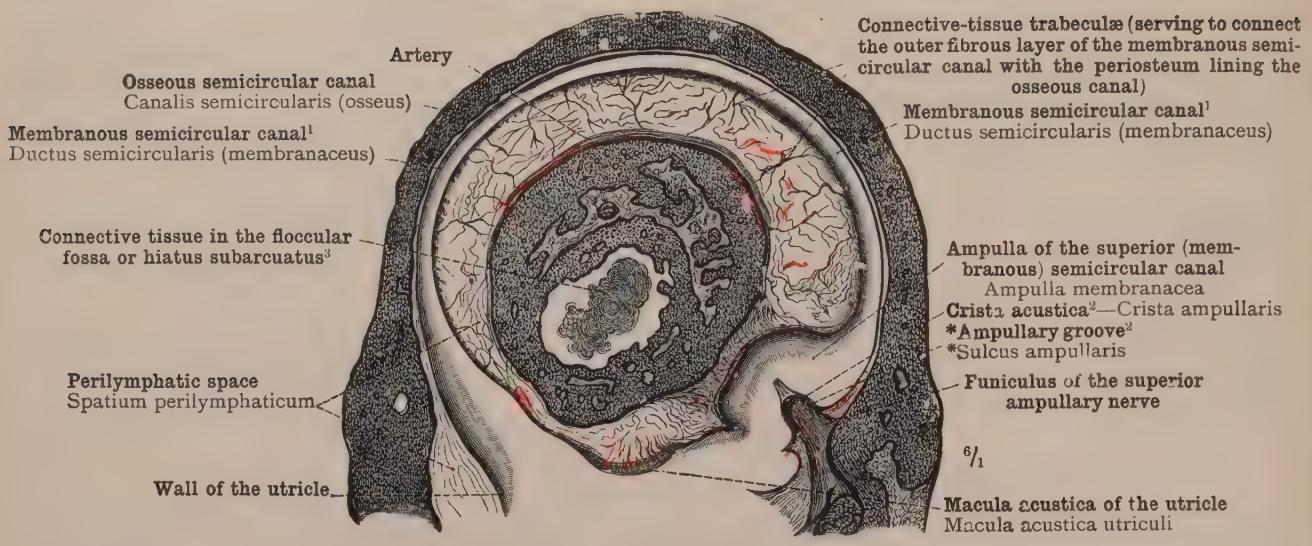

Artery
Osseous semicircular canal
Canalis semicircularis (osseus)
Membranous semicircular canal[1]
Ductus semicircularis (membranaceus)
Connective tissue in the floccular fossa or hiatus subarcuatus[3]
Perilymphatic space
Spatium perilymphaticum
Wall of the utricle
Connective-tissue trabeculæ (serving to connect the outer fibrous layer of the membranous semicircular canal with the periosteum lining the osseous canal)
Membranous semicircular canal[1]
Ductus semicircularis (membranaceus)
Ampulla of the superior (membranous) semicircular canal
Ampulla membranacea
Crista acustica[2]—Crista ampullaris
*Ampullary groove[2]
*Sulcus ampullaris
Funiculus of the superior ampullary nerve
6/1
Macula acustica of the utricle
Macula acustica utriculi

FIG. 1462.—LONGITUDINAL SECTION THROUGH THE SUPERIOR (OSSEOUS AND MEMBRANOUS) SEMICIRCULAR CANAL; THE CRISTA ACUSTICA. CRISTA AMPULLARIS (*see Appendix, note* [543]), WITH THE NERVE TERMINAL, IS SEEN IN TRANSVERSE SECTION.

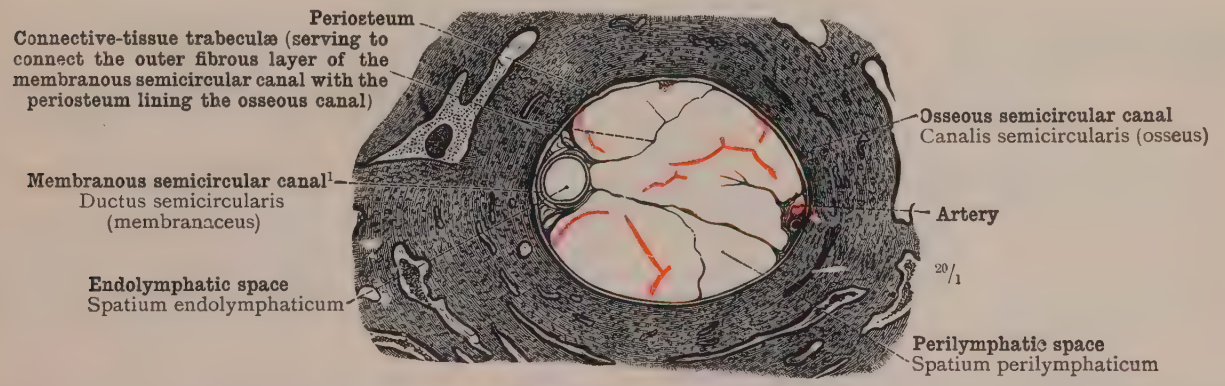


FIG. 1463.—TRANSVERSE SECTION THROUGH THE SIMPLE CRUS OF THE SUPERIOR (OSSEOUS AND MEMBRANOUS) SEMICIRCULAR CANAL.

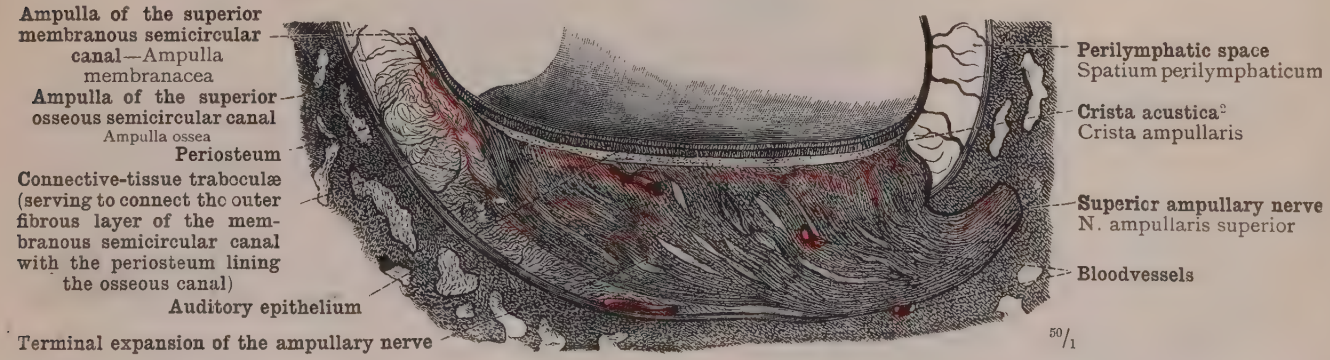

Ampulla of the superior membranous semicircular canal—Ampulla membranacea
Ampulla of the superior osseous semicircular canal
Ampulla ossea
Periosteum
Connective-tissue trabeculæ (serving to connect the outer fibrous layer of the membranous semicircular canal with the periosteum lining the osseous canal)
Auditory epithelium
Terminal expansion of the ampullary nerve
Perilymphatic space
Spatium perilymphaticum
Crista acustica[2]
Crista ampullaris
Superior ampullary nerve
N. ampullaris superior
Bloodvessels
50/1

FIG. 1464.—SECTION THROUGH THE AMPULLA OF THE SUPERIOR SEMICIRCULAR CANAL ALONG THE CRISTA ACUSTICA (*see Appendix, note* [543]); THE NERVE TERMINAL AND THE NERVE FILAMENT PASSING TO THE CREST ARE DIVIDED LONGITUDINALLY.

ALL THREE SPECIMENS FIGURED ON THIS PAGE WERE PREPARED FROM THE DECALCIFIED PETROUS BONE OF A NEW-BORN INFANT.

1 See Appendix, note 542. 2 See Appendix, note 543.
3 By Toldt called *fossa subarcuata*—see Fig. 129, p. 63, and Fig. 144, p. 70, in Part I. It receives its name because, in the infantile state of the bone (here figured), the fossa passes beneath the arch of the superior semicircular canal. In the adult this deep pit is replaced by a small foramen occupied by a strand of connective tissue.

Auris interna—The internal ear.—Termination of the Auditory Nerve.

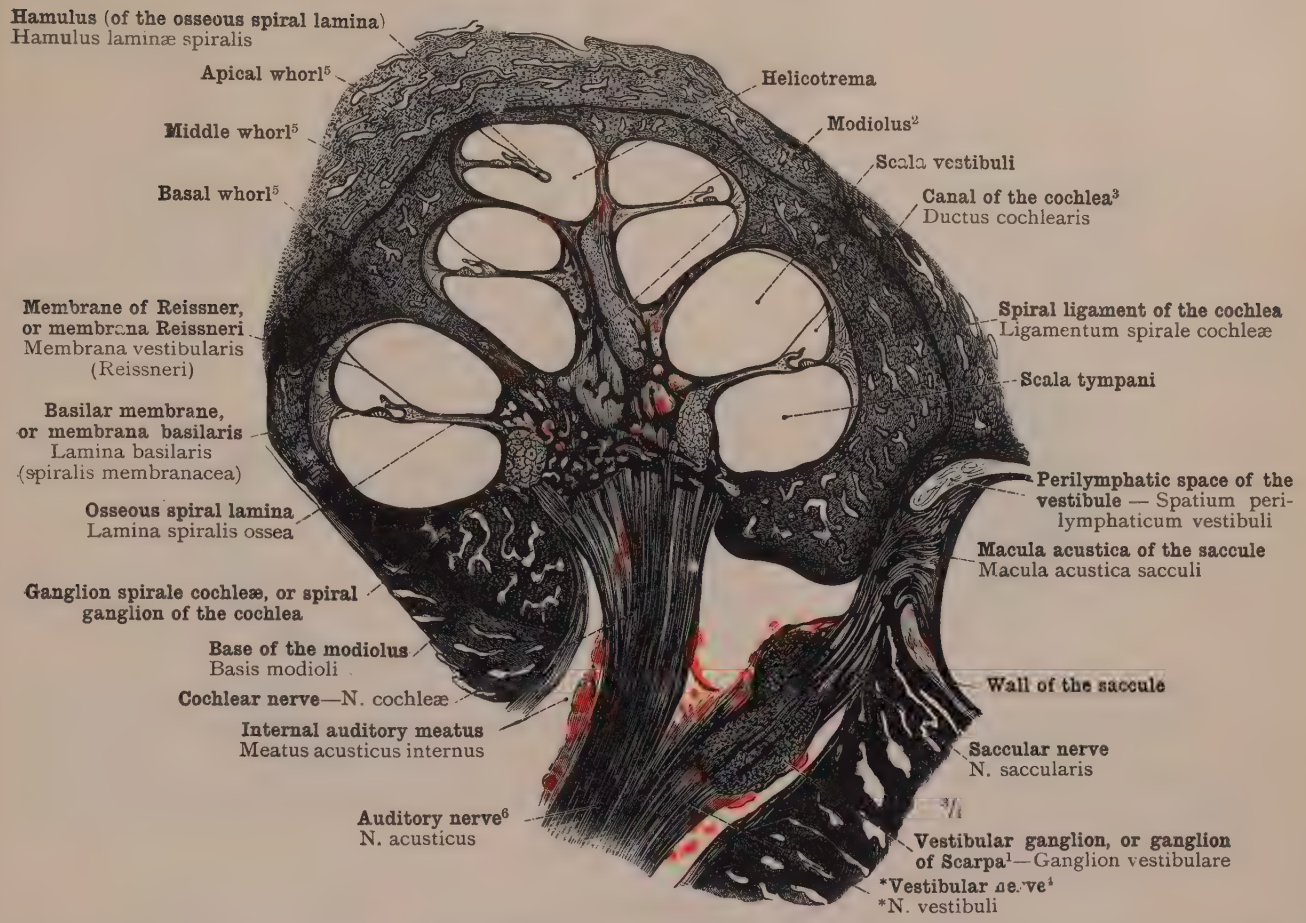


FIG. 1465.—AXIAL SECTION THROUGH THE DECALCIFIED COCHLEA OF A NEW-BORN INFANT. ENTRANCE OF THE COCHLEAR NERVE. ON THE RIGHT SIDE OF THE PREPARATION WE SEE THE MACULA ACUSTICA OF THE SACCULE, THE NERVE TERMINAL OF THE SACCULAR NERVE, AND ALSO THE VESTIBULAR GANGLION OR GANGLION OF SCARPA, GANGLION VESTIBULARE.[1]

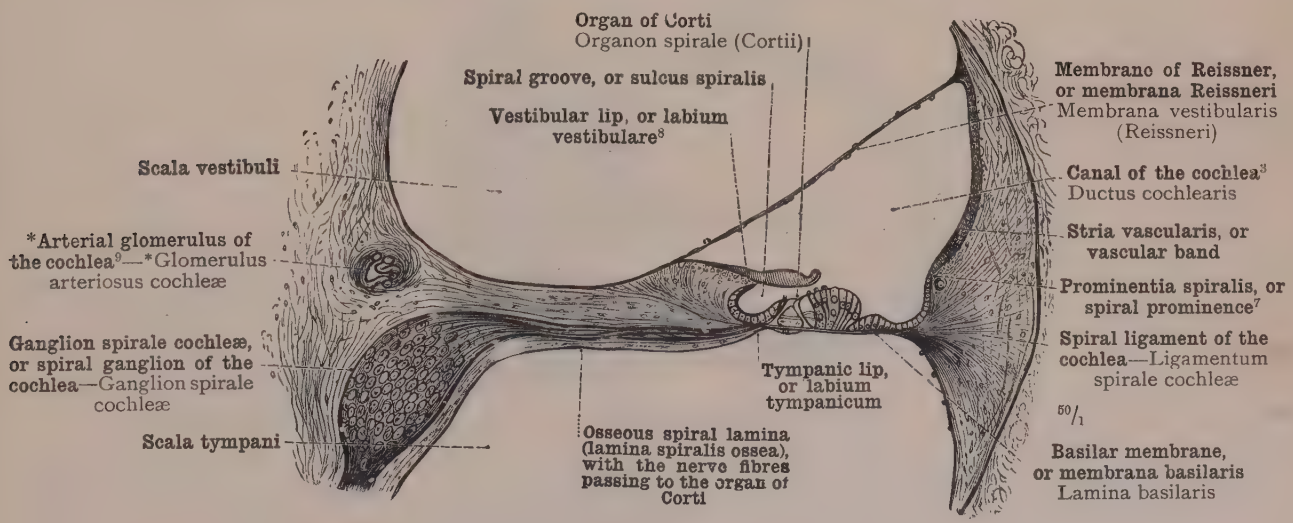

Organ of Corti
Organon spirale (Cortii)
Spiral groove, or sulcus spiralis
Vestibular lip, or labium vestibulare[8]
Scala vestibuli
*Arterial glomerulus of the cochlea[9]—*Glomerulus arteriosus cochleæ
Ganglion spirale cochleæ, or spiral ganglion of the cochlea—Ganglion spirale cochleæ
Scala tympani
Tympanic lip, or labium tympanicum
Osseous spiral lamina (lamina spiralis ossea), with the nerve fibres passing to the organ of Corti
Membrane of Reissner, or membrana Reissneri
Membrana vestibularis (Reissneri)
Canal of the cochlea[3]
Ductus cochlearis
Stria vascularis, or vascular band
Prominentia spiralis, or spiral prominence[7]
Spiral ligament of the cochlea—Ligamentum spirale cochleæ
50/1
Basilar membrane, or membrana basilaris
Lamina basilaris

FIG. 1466.—AXIAL SECTION THROUGH ONE OF THE WHORLS OF THE COCHLEA (*see Appendix, note* 530). CANAL OF THE COCHLEA, DUCTUS COCHLEARIS,[3] WITH THE TERMINAL APPARATUS OF THE COCHLEAR NERVE, KNOWN AS THE ORGAN OF CORTI, ORGANON SPIRALE.

1 Or *intumescentia ganglioformis Scarpæ*. 2 Also known as the *columella cochleæ*.
3 Or, more briefly, the *cochlear canal*. Also known in England by the Latin names *canalis* (*membranaceus*) *cochleæ* and *ductus cochlearis*. It was formerly known as the *scala media*. See also Appendix, note 536.
4 See Appendix, note 548. 5 See Appendix, note 530.
6 *Eighth cranial nerve* in Soemmerring's enumeration; *portio mollis* of the *seventh* in that of Willis.
7 See Appendix, note 549.
8 The *vestibular lip* of the osseous spiral lamina is also known as the *crista spiralis*, and sometimes as the *labium sulcatum* (Macalister).
9 See Appendix, note 550.

Auris interna—The internal ear.—Termination of the Auditory Nerve.

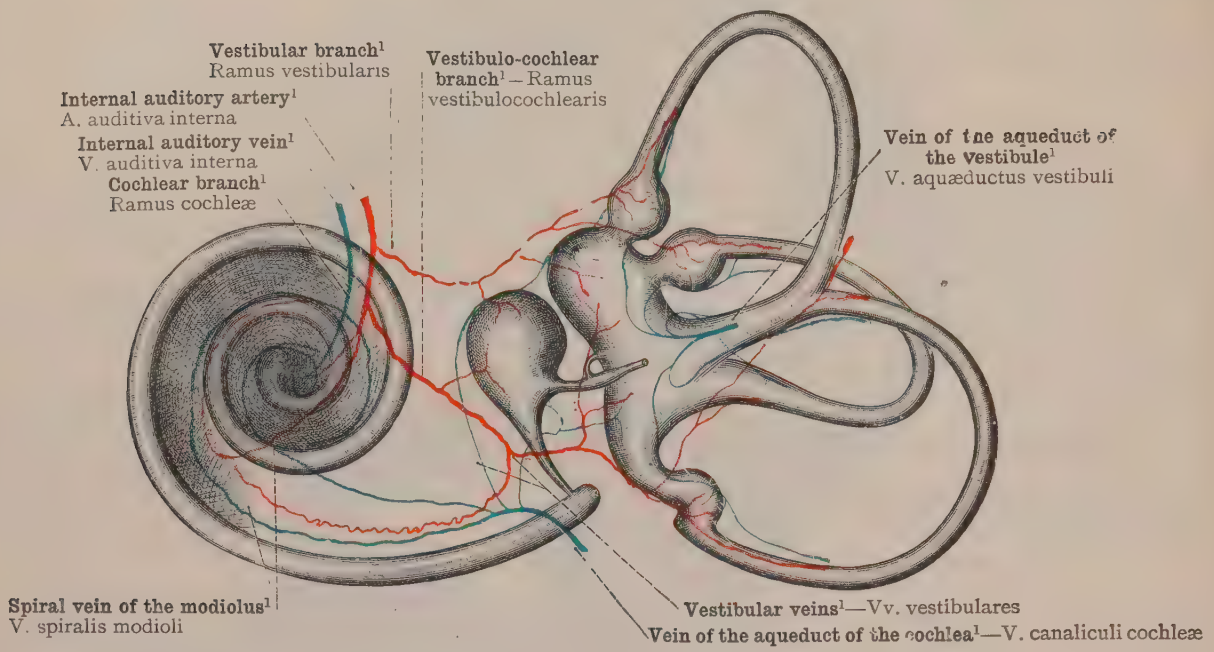


FIG. 1467.—DIAGRAMMATIC REPRESENTATION OF THE DISTRIBUTION OF THE BLOODVESSELS OF THE MEMBRANOUS LABYRINTH. (BASED ON THE RESEARCHES OF SIEBENMANN; *see Appendix, note* [551].)

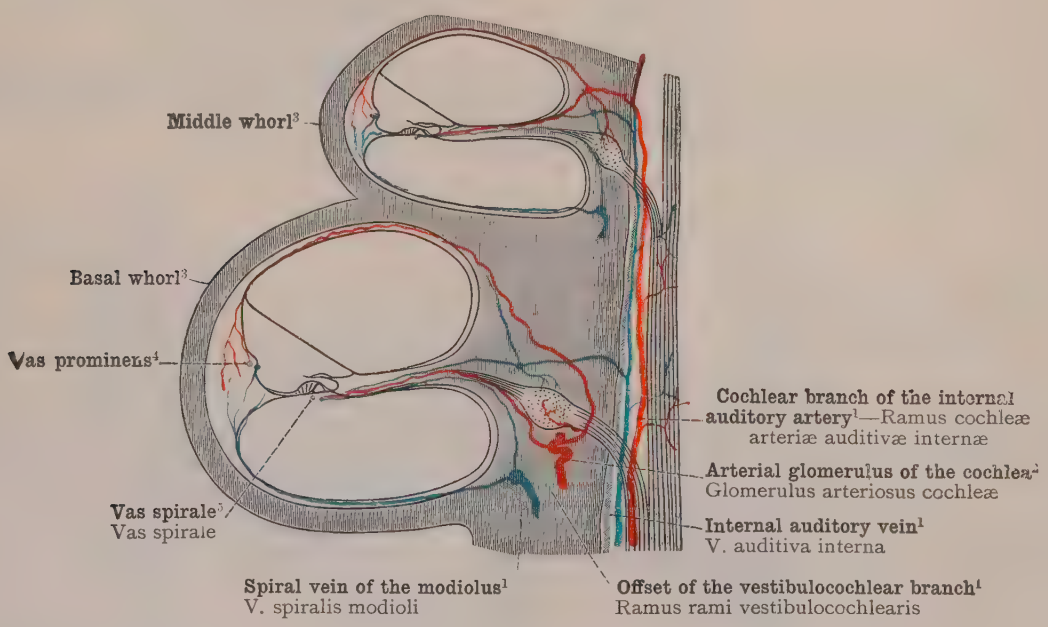


FIG. 1468.—DIAGRAMMATIC REPRESENTATION OF THE DISTRIBUTION OF THE BLOODVESSELS OF THE COCHLEA (*see Appendix, note* [551]).

1 See Appendix, note 551. 2 See Appendix, note 550. 3 See Appendix, note 530.
4 See Appendix, note 549. 5 See Appendix, note 552.

Auris interna—The internal ear.—The Bloodvessels of the Labyrinth (*see Appendix, note* [551]).

ORGANON OLFACTUS, CAVUM NASI

THE NOSE

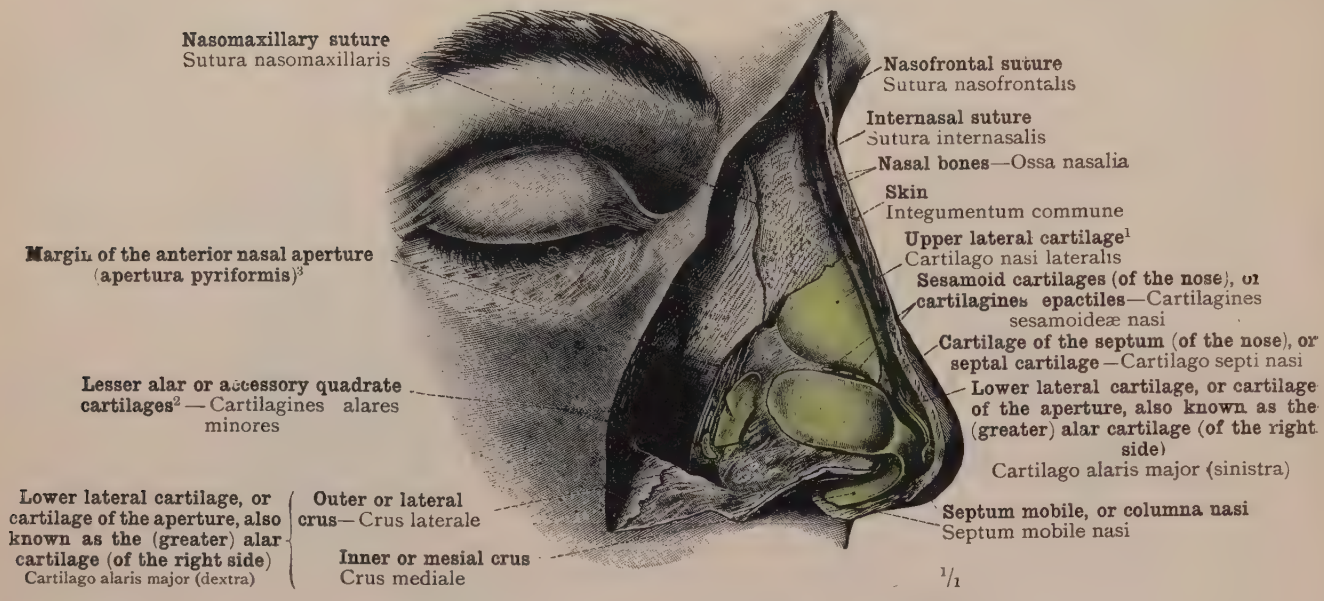

Nasomaxillary suture
Sutura nasomaxillaris
Nasofrontal suture
Sutura nasofrontalis
Internasal suture
Sutura internasalis
Nasal bones—Ossa nasalia
Skin
Integumentum commune
Upper lateral cartilage[1]
Cartilago nasi lateralis
Sesamoid cartilages (of the nose), or cartilagines epactiles—Cartilagines sesamoideæ nasi
Cartilage of the septum (of the nose), or septal cartilage—Cartilago septi nasi
Lower lateral cartilage, or cartilage of the aperture, also known as the (greater) alar cartilage (of the right side)
Cartilago alaris major (sinistra)
Septum mobile, or columna nasi
Septum mobile nasi
Margin of the anterior nasal aperture (apertura pyriformis)[3]
Lesser alar or accessory quadrate cartilages[2]—Cartilagines alares minores
Lower lateral cartilage, or cartilage of the aperture, also known as the (greater) alar cartilage (of the right side)
Cartilago alaris major (dextra)
Outer or lateral crus—Crus laterale
Inner or mesial crus
Crus mediale
1/1

FIG. 1469.—THE CARTILAGES OF THE NOSE, DISPLAYED BY THE REMOVAL OF THE SKIN AND THE MUSCLES FROM THE RIGHT SIDE OF THE NOSE: THE LOWER LATERAL CARTILAGE OR CARTILAGE OF THE APERTURE, ALSO KNOWN AS THE (GREATER) ALAR CARTILAGE, CARTILAGO ALARIS MAJOR, AND THE LESSER ALAR OR ACCESSORY QUADRATE CARTILAGES, CARTILAGINES ALARES MINORES,[2] FORMING THE GROUNDWORK OF THE ALA NASI; THE UPPER LATERAL CARTILAGE, CARTILAGO NASI LATERALIS,[1] WHICH, IN CONJUNCTION WITH THE NASAL BONE, COMPLETES THE FRAMEWORK OF THE DORSUM OF THE NOSE; THE SESAMOID CARTILAGES (OF THE NOSE), OR CARTILAGINES EPACTILES, CARTILAGINES SESAMOIDEÆ NASI.

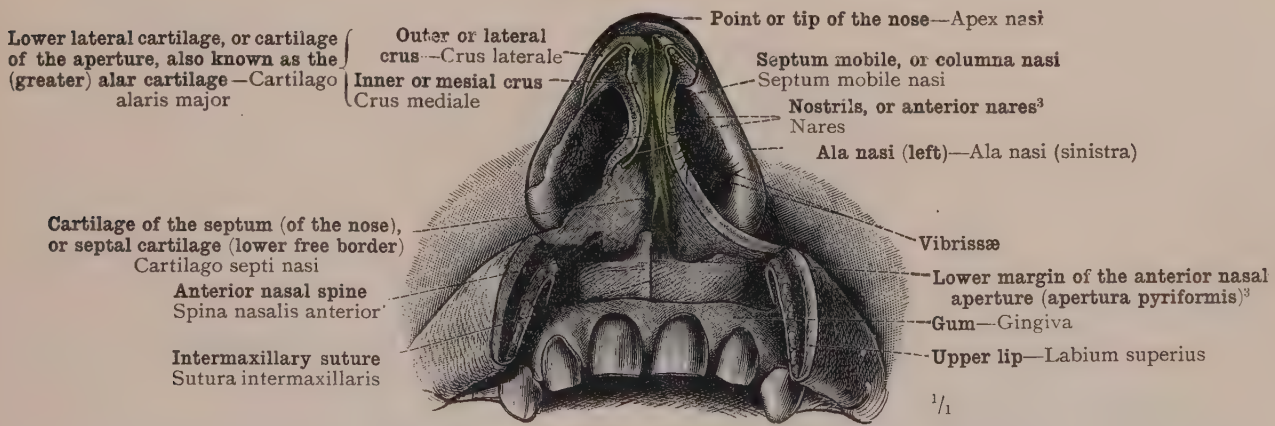

Point or tip of the nose—Apex nasi
Lower lateral cartilage, or cartilage of the aperture, also known as the (greater) alar cartilage—Cartilago alaris major
Outer or lateral crus—Crus laterale
Inner or mesial crus
Crus mediale
Septum mobile, or columna nasi
Septum mobile nasi
Nostrils, or anterior nares[3]
Nares
Ala nasi (left)—Ala nasi (sinistra)
Cartilage of the septum (of the nose), or septal cartilage (lower free border)
Cartilago septi nasi
Anterior nasal spine
Spina nasalis anterior
Intermaxillary suture
Sutura intermaxillaris
Vibrissæ
Lower margin of the anterior nasal aperture (apertura pyriformis)[3]
Gum—Gingiva
Upper lip—Labium superius
1/1

FIG. 1470.—THE NOSTRILS OR ANTERIOR NARES[3]: BETWEEN THEM IS THE MOVABLE PORTION OF THE SEPTUM OF THE NOSE, SEPTUM MOBILE OR COLUMNA NASI (ALSO KNOWN IN THE GERMAN OFFICIAL NOMENCLATURE AS "SEPTUM MEMBRANACEUM NASI"; AS GROUNDWORK OF THE NOSTRILS WE SEE ON EACH SIDE THE INNER OR MESIAL CRUS OF THE LOWER LATERAL CARTILAGE OR CARTILAGE OF THE APERTURE, CARTILAGO ALARIS MAJOR.

[1] By Macalister called the *lateral expansion of the septal cartilage;* or sometimes, the *lower lateral cartilage* of Quain being by Macalister called the *alar cartilage*, the *upper lateral cartilage* of Quain is by Macalister called simply the *lateral cartilage*.

[2] *Lesser Alar Cartilages.*—The name of *lesser* alar cartilage is given in contrast with the name of (*greater*) alar cartilage by which the lower lateral cartilage or cartilage of the aperture is sometimes known. Quain, however, calls them *cartilagines minores* vel *quadratæ;* while the name *accessory quadrate cartilages* is used by Macalister.

[3] *Anterior Nasal Aperture and Anterior Nares.*—The *anterior nasal aperture* (*apertura pyriformis* in the official German nomenclature, and the name is often used also in England) is the anterior orifice of the nasal fossæ in the dried skull; the *anterior nares*, on the other hand, are the *nostrils*, the anterior orifices of the nasal fossæ when the soft parts are intact.

Cartilagines nasi—The nasal cartilages.

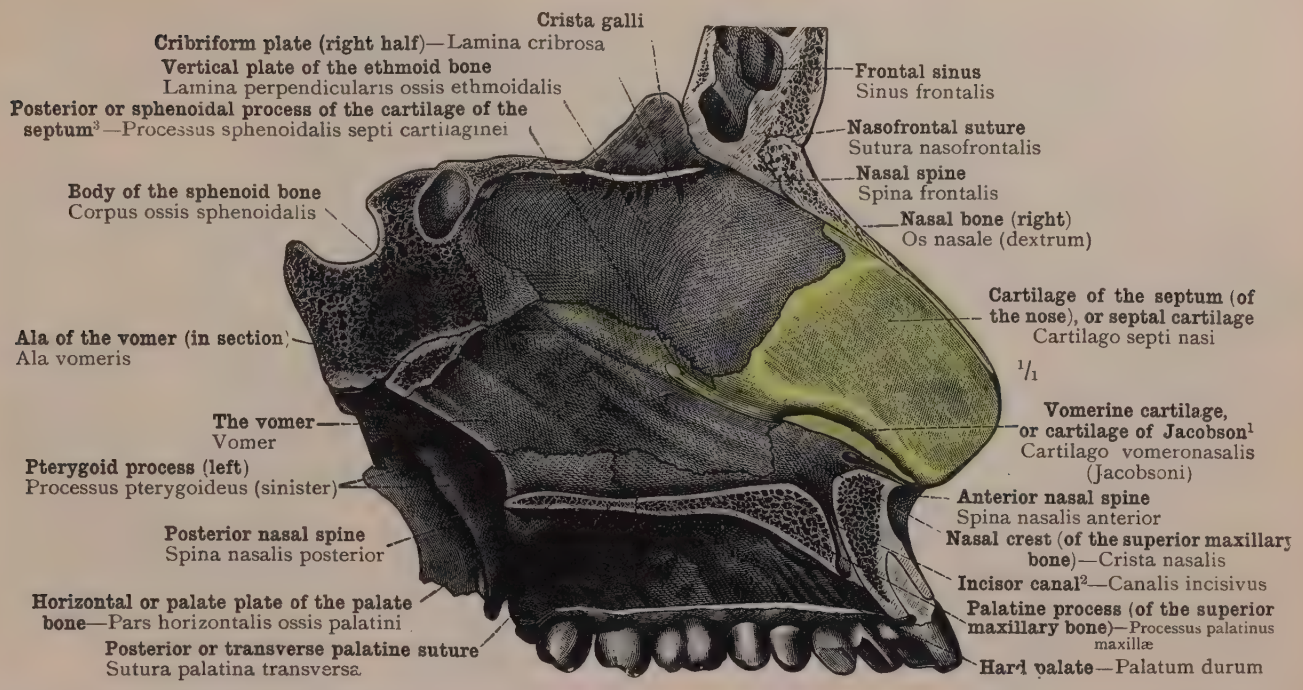

Crista galli
Cribriform plate (right half)—Lamina cribrosa
Vertical plate of the ethmoid bone
Lamina perpendicularis ossis ethmoidalis
Posterior or sphenoidal process of the cartilage of the septum[3]—Processus sphenoidalis septi cartilaginei
Body of the sphenoid bone
Corpus ossis sphenoidalis
Ala of the vomer (in section)
Ala vomeris
The vomer
Vomer
Pterygoid process (left)
Processus pterygoideus (sinister)
Posterior nasal spine
Spina nasalis posterior
Horizontal or palate plate of the palate bone—Pars horizontalis ossis palatini
Posterior or transverse palatine suture
Sutura palatina transversa
Frontal sinus
Sinus frontalis
Nasofrontal suture
Sutura nasofrontalis
Nasal spine
Spina frontalis
Nasal bone (right)
Os nasale (dextrum)
Cartilage of the septum (of the nose), or septal cartilage
Cartilago septi nasi
1/1
Vomerine cartilage, or cartilage of Jacobson[1]
Cartilago vomeronasalis (Jacobsoni)
Anterior nasal spine
Spina nasalis anterior
Nasal crest (of the superior maxillary bone)—Crista nasalis
Incisor canal[2]—Canalis incisivus
Palatine process (of the superior maxillary bone)—Processus palatinus maxillæ
Hard palate—Palatum durum

FIG. 1471.—THE OSSEOUS AND CARTILAGINOUS SEPTUM OF THE NOSE, SEPTUM OSSEUM ET SEPTUM CARTILAGINEUM NASI; ALONG THE LOWER BORDER OF THE CARTILAGE OF THE SEPTUM IS THE VOMERINE CARTILAGE OR CARTILAGE OF JACOBSON (CARTILAGO VOMERONASALIS—*see Appendix, note* 553). SEEN FROM THE RIGHT SIDE.

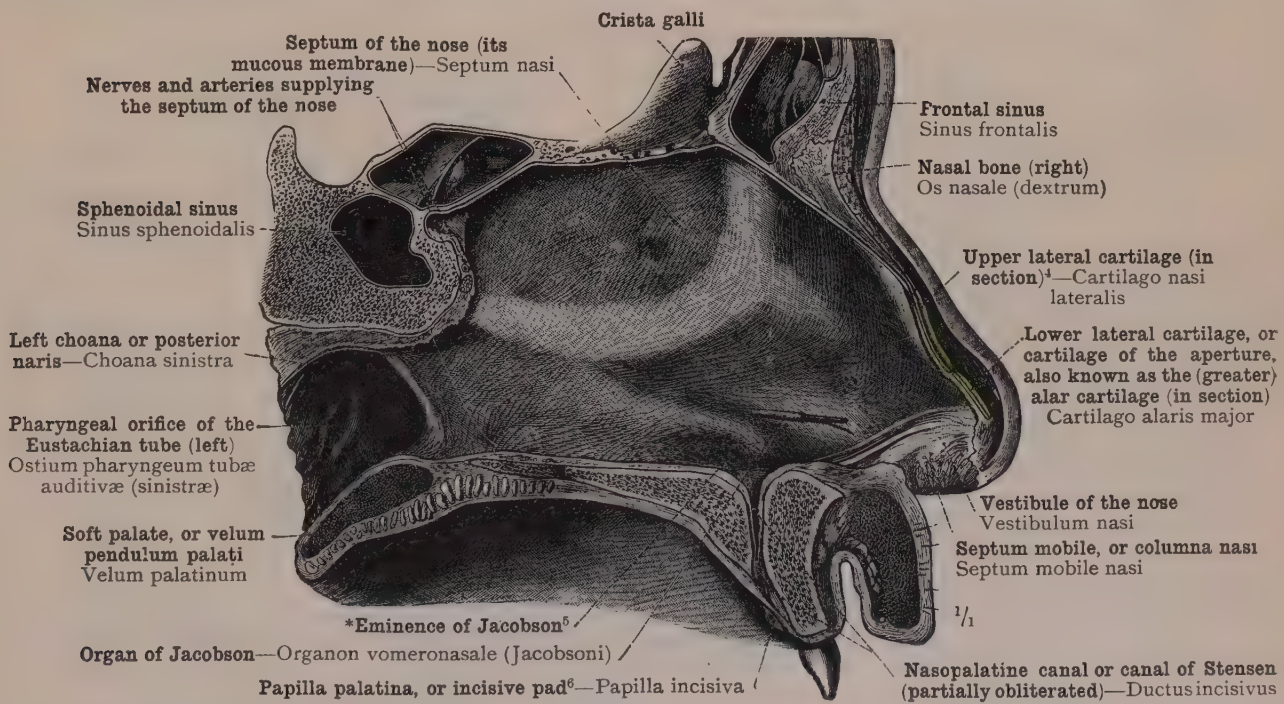

Crista galli
Septum of the nose (its mucous membrane)—Septum nasi
Nerves and arteries supplying the septum of the nose
Sphenoidal sinus
Sinus sphenoidalis
Left choana or posterior naris—Choana sinistra
Pharyngeal orifice of the Eustachian tube (left)
Ostium pharyngeum tubæ auditivæ (sinistræ)
Soft palate, or velum pendulum palati
Velum palatinum
*Eminence of Jacobson[5]
Organ of Jacobson—Organon vomeronasale (Jacobsoni)
Papilla palatina, or incisive pad[6]—Papilla incisiva
Frontal sinus
Sinus frontalis
Nasal bone (right)
Os nasale (dextrum)
Upper lateral cartilage (in section)[4]—Cartilago nasi lateralis
Lower lateral cartilage, or cartilage of the aperture, also known as the (greater) alar cartilage (in section)
Cartilago alaris major
Vestibule of the nose
Vestibulum nasi
Septum mobile, or columna nasi
Septum mobile nasi
1/1
Nasopalatine canal or canal of Stensen (partially obliterated)—Ductus incisivus

FIG. 1472.—THE NASAL SEPTUM, SEPTUM NASI, COVERED BY ITS MUCOUS MEMBRANE, SEEN FROM THE RIGHT SIDE. CORRESPONDING TO THE LOWER MARGIN OF THE CARTILAGE OF THE SEPTUM IS THE BOUNDARY BETWEEN THE VESTIBULE OF THE NOSE, VESTIBULUM NASI, AND THE NASAL FOSSÆ PROPER, CAVUM NASI. A SOUND HAS BEEN PASSED INTO THE CANAL OF THE RUDIMENTARY ORGAN OF JACOBSON.

[1] See Appendix, note 553. [2] See Appendix, note 451.
[3] The Latin name only of this process is mentioned by Quain—*processus posterior* seu *sphenoidalis*.
[4] See note [1] to p. 942. [5] See Appendix, note 554. [6] See note 5 to p. 416, in Part IV.

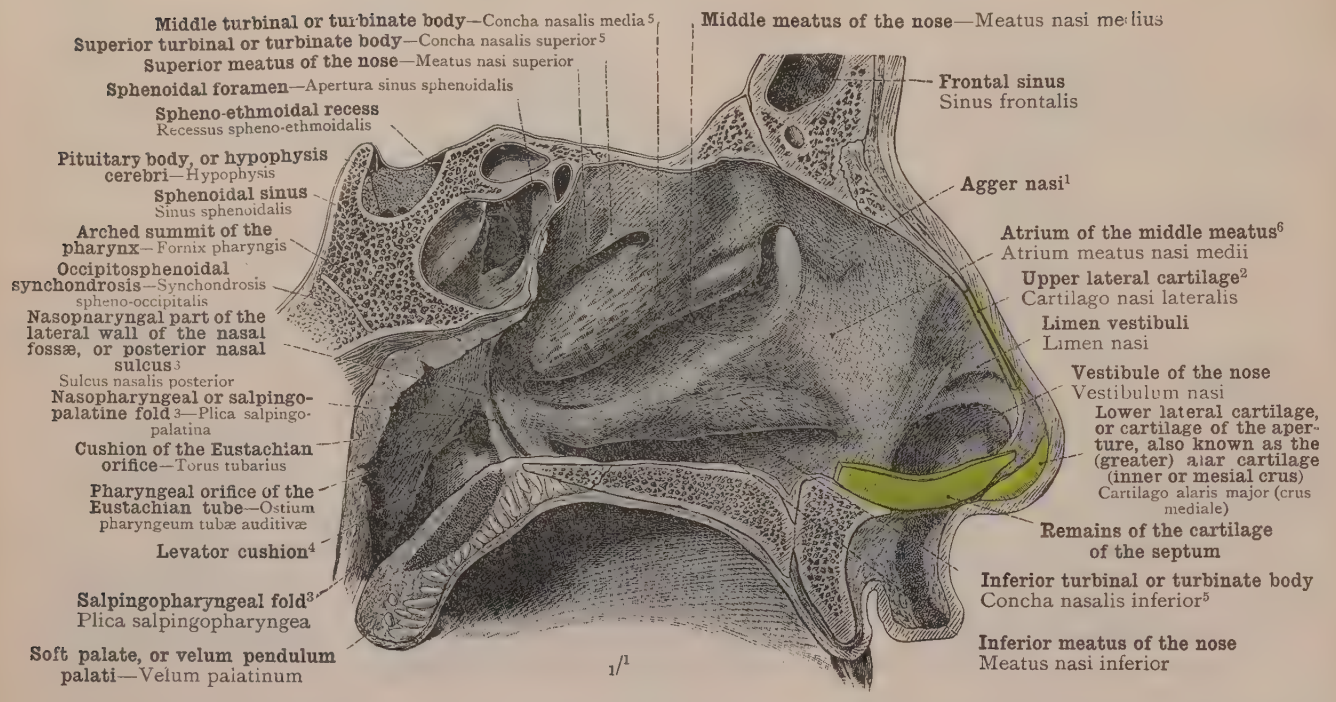

Middle turbinal or turbinate body—Concha nasalis media[5]
Superior turbinal or turbinate body—Concha nasalis superior[5]
Superior meatus of the nose—Meatus nasi superior
Sphenoidal foramen—Apertura sinus sphenoidalis
Spheno-ethmoidal recess
Recessus spheno-ethmoidalis
Pituitary body, or hypophysis cerebri—Hypophysis
Sphenoidal sinus
Sinus sphenoidalis
Arched summit of the pharynx—Fornix pharyngis
Occipitosphenoidal synchondrosis—Synchondrosis spheno-occipitalis
Nasopharyngal part of the lateral wall of the nasal fossæ, or posterior nasal sulcus[3]
Sulcus nasalis posterior
Nasopharyngeal or salpingo-palatine fold[3]—Plica salpingo-palatina
Cushion of the Eustachian orifice—Torus tubarius
Pharyngeal orifice of the Eustachian tube—Ostium pharyngeum tubæ auditivæ
Levator cushion[4]
Salpingopharyngeal fold[3]
Plica salpingopharyngea
Soft palate, or velum pendulum palati—Velum palatinum
Middle meatus of the nose—Meatus nasi medius
Frontal sinus
Sinus frontalis
Agger nasi[1]
Atrium of the middle meatus[6]
Atrium meatus nasi medii
Upper lateral cartilage[2]
Cartilago nasi lateralis
Limen vestibuli
Limen nasi
Vestibule of the nose
Vestibulum nasi
Lower lateral cartilage, or cartilage of the aperture, also known as the (greater) alar cartilage (inner or mesial crus)
Cartilago alaris major (crus mediale)
Remains of the cartilage of the septum
Inferior turbinal or turbinate body
Concha nasalis inferior[5]
Inferior meatus of the nose
Meatus nasi inferior
1/1

FIG. 1473.—THE LEFT LATERAL WALL OF THE NASAL FOSSÆ WITH THE TURBINATE BONES AND THE NASAL MEATUS. THE VESTIBULE OF THE NOSE, VESTIBULUM NASI, IS MARKED OFF FROM THE NASAL FOSSÆ PROPER BY THE LIMEN VESTIBULI, LIMEN NASI, WHICH CORRESPONDS TO THE LOWER MARGIN OF THE UPPER LATERAL CARTILAGE.

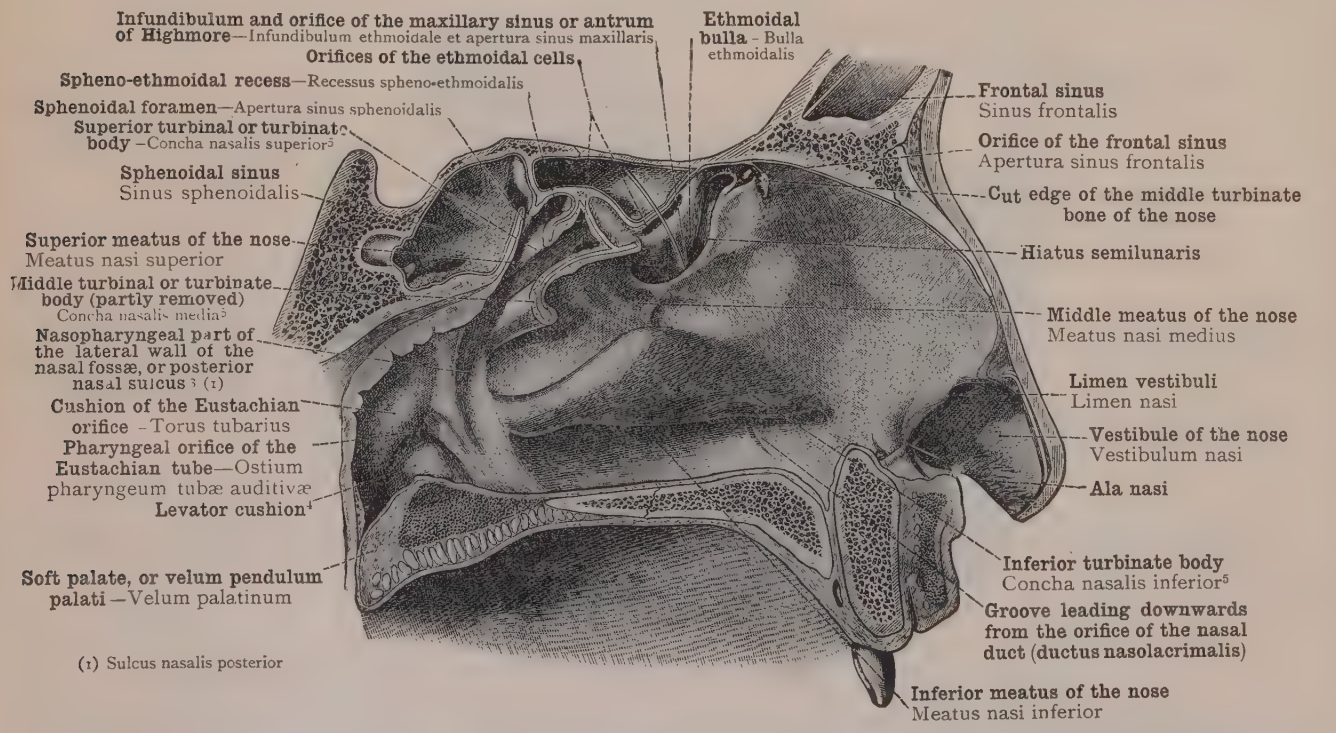

Infundibulum and orifice of the maxillary sinus or antrum of Highmore—Infundibulum ethmoidale et apertura sinus maxillaris
Orifices of the ethmoidal cells
Ethmoidal bulla—Bulla ethmoidalis
Spheno-ethmoidal recess—Recessus spheno-ethmoidalis
Sphenoidal foramen—Apertura sinus sphenoidalis
Superior turbinal or turbinate body—Concha nasalis superior[5]
Sphenoidal sinus
Sinus sphenoidalis
Superior meatus of the nose
Meatus nasi superior
Middle turbinal or turbinate body (partly removed)
Concha nasalis media[5]
Nasopharyngeal part of the lateral wall of the nasal fossæ, or posterior nasal sulcus[3] (1)
Cushion of the Eustachian orifice—Torus tubarius
Pharyngeal orifice of the Eustachian tube—Ostium pharyngeum tubæ auditivæ
Levator cushion[4]
Soft palate, or velum pendulum palati—Velum palatinum
(1) Sulcus nasalis posterior
Frontal sinus
Sinus frontalis
Orifice of the frontal sinus
Apertura sinus frontalis
Cut edge of the middle turbinate bone of the nose
Hiatus semilunaris
Middle meatus of the nose
Meatus nasi medius
Limen vestibuli
Limen nasi
Vestibule of the nose
Vestibulum nasi
Ala nasi
Inferior turbinate body
Concha nasalis inferior[5]
Groove leading downwards from the orifice of the nasal duct (ductus nasolacrimalis)
Inferior meatus of the nose
Meatus nasi inferior

FIG. 1474.—THE LEFT LATERAL WALL OF THE NASAL FOSSÆ, THE GREATER PART OF THE MIDDLE TURBINAL AND THE ANTERIOR PORTION OF THE SUPERIOR TURBINAL HAVING BEEN REMOVED. THE ORIFICES OF THE ACCESSORY CAVITIES OF THE NOSE, SINUS PARANASALES: OF THE SPHENOIDAL SINUS, SINUS SPHENOIDALIS, THE FRONTAL SINUS, SINUS FRONTALIS, AND THE MAXILLARY SINUS OR ANTRUM OF HIGHMORE, SINUS MAXILLARIS. THE TWO LAST-NAMED ORIFICES ARE DISTINGUISHED BY SOUNDS WHICH HAVE BEEN PASSED THROUGH THEM.

[1] *Agger Nasi.*—This ridge, which is visible also in the dried bone (see Fig. 160, p. 78, and Figs. 203 and 204, p. 90, Part I.), is a rudiment of the nasoturbinal met with in most mammals.

[2] See note [1] to p. 942. [3] See Appendix to Part IV., note 4. [4] See note 4 to p. 436, in Part IV.

[5] *Conchæ Nasales.*—In Toldt's nomenclature the same term *concha nasalis*, is used to denote the *turbinate bone* and the *turbinal* or *turbinate body*—*i.e.*, the turbinate bone covered by mucous membrane.

[6] By Macalister called the *region of the atrium.*

Paries lateralis nasi—Lateral wall of the nasal fossæ.

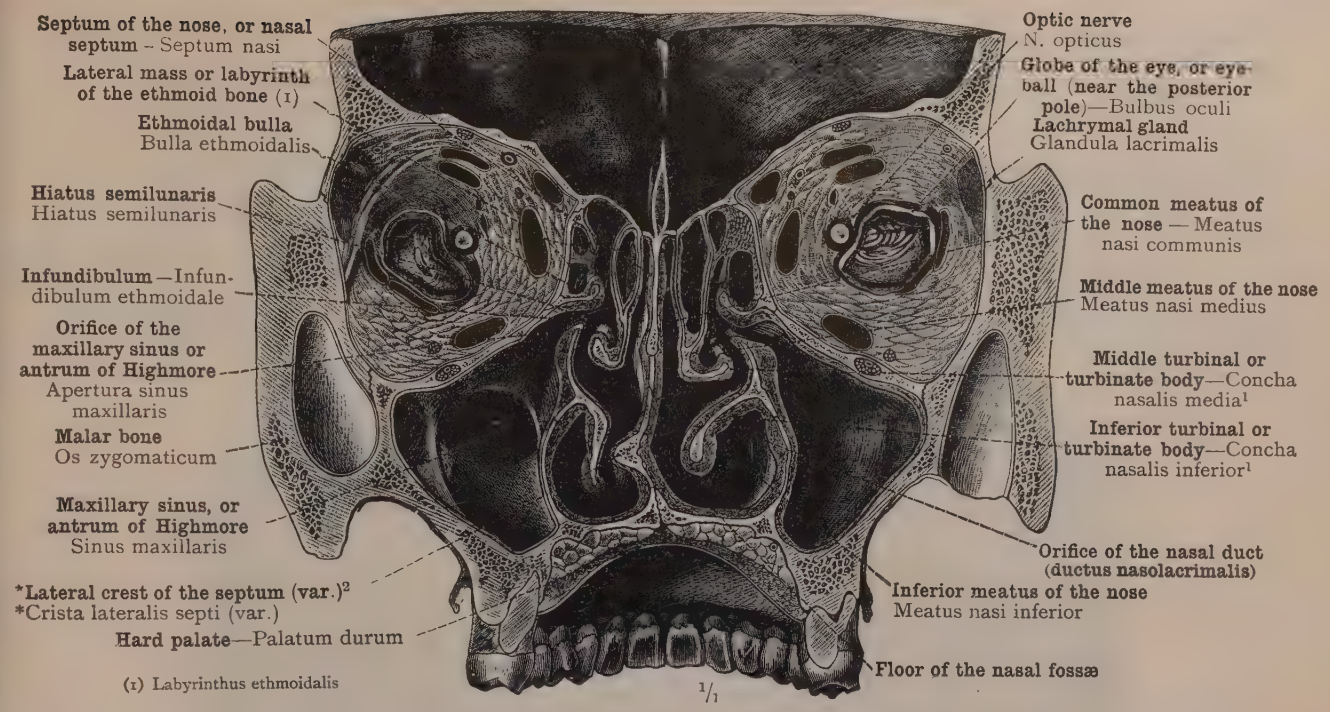

Septum of the nose, or nasal septum – Septum nasi
Lateral mass or labyrinth of the ethmoid bone (1)
Ethmoidal bulla
Bulla ethmoidalis
Hiatus semilunaris
Hiatus semilunaris
Infundibulum—Infundibulum ethmoidale
Orifice of the maxillary sinus or antrum of Highmore
Apertura sinus maxillaris
Malar bone
Os zygomaticum
Maxillary sinus, or antrum of Highmore
Sinus maxillaris
*Lateral crest of the septum (var.)[2]
*Crista lateralis septi (var.)
Hard palate—Palatum durum
(1) Labyrinthus ethmoidalis
1/1
Optic nerve
N. opticus
Globe of the eye, or eyeball (near the posterior pole)—Bulbus oculi
Lachrymal gland
Glandula lacrimalis
Common meatus of the nose — Meatus nasi communis
Middle meatus of the nose
Meatus nasi medius
Middle turbinal or turbinate body—Concha nasalis media[1]
Inferior turbinal or turbinate body—Concha nasalis inferior[1]
Orifice of the nasal duct (ductus nasolacrimalis)
Inferior meatus of the nose
Meatus nasi inferior
Floor of the nasal fossæ

FIG. 1475.—CORONAL SECTION PASSING NEARLY THROUGH THE MIDDLE OF THE NASAL FOSSÆ. THE ANTERIOR SEGMENT VIEWED FROM BEHIND. ORIFICES OF THE MAXILLARY SINUSES OR ANTRA OF HIGHMORE. THE ORBITS ARE DIVIDED IN A PLANE IMMEDIATELY BEHIND THE ENTRANCE OF THE OPTIC NERVE INTO THE EYEBALL.

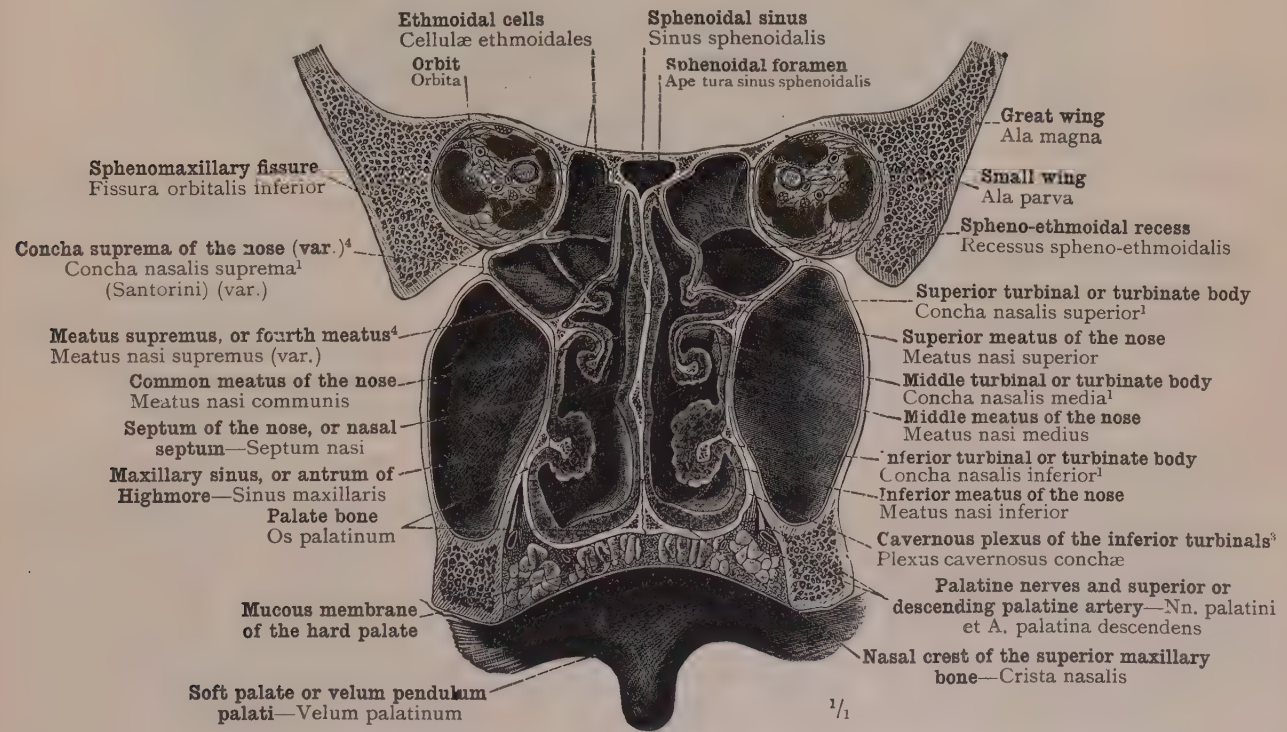


FIG. 1476.—CORONAL SECTION THROUGH THE POSTERIOR PART OF THE NASAL FOSSÆ AND THE MAXILLARY SINUSES OR ANTRA OF HIGHMORE. THE POSTERIOR SEGMENT VIEWED FROM BEFORE. SPHENOIDAL FORAMINA.

[1] See note 5 to p. 944. [2] See Appendix, note 555. See Appendix, note 556. [4] See Appendix, note 557.

Cavum nasi—The nasal fossæ.

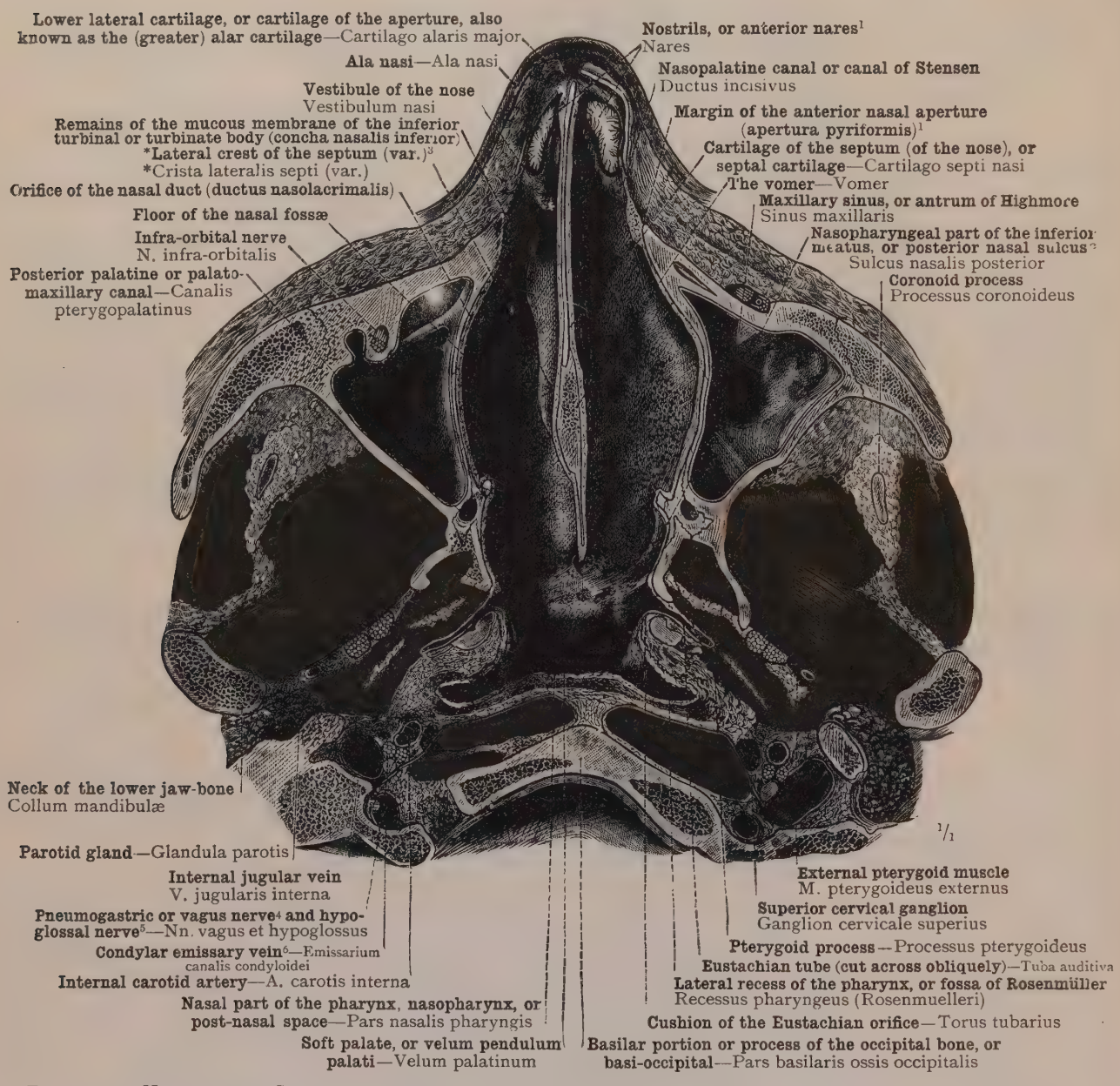

Lower lateral cartilage, or cartilage of the aperture, also known as the (greater) alar cartilage—Cartilago alaris major
Nostrils, or anterior nares[1] Nares
Ala nasi—Ala nasi
Nasopalatine canal or canal of Stensen Ductus incisivus
Vestibule of the nose Vestibulum nasi
Margin of the anterior nasal aperture (apertura pyriformis)[1]
Remains of the mucous membrane of the inferior turbinal or turbinate body (concha nasalis inferior)
*Lateral crest of the septum (var.)[3]
*Crista lateralis septi (var.)
Cartilage of the septum (of the nose), or septal cartilage—Cartilago septi nasi
The vomer—Vomer
Orifice of the nasal duct (ductus nasolacrimalis)
Maxillary sinus, or antrum of Highmore Sinus maxillaris
Floor of the nasal fossæ
Infra-orbital nerve N. infra-orbitalis
Nasopharyngeal part of the inferior meatus, or posterior nasal sulcus[2] Sulcus nasalis posterior
Posterior palatine or palato-maxillary canal—Canalis pterygopalatinus
Coronoid process Processus coronoideus
Neck of the lower jaw-bone Collum mandibulæ
1/1
Parotid gland—Glandula parotis
Internal jugular vein V. jugularis interna
External pterygoid muscle M. pterygoideus externus
Pneumogastric or vagus nerve[4] and hypoglossal nerve[5]—Nn. vagus et hypoglossus
Superior cervical ganglion Ganglion cervicale superius
Condylar emissary vein[6]—Emissarium canalis condyloidei
Pterygoid process—Processus pterygoideus
Eustachian tube (cut across obliquely)—Tuba auditiva
Internal carotid artery—A. carotis interna
Lateral recess of the pharynx, or fossa of Rosenmüller Recessus pharyngeus (Rosenmuelleri)
Nasal part of the pharynx, nasopharynx, or post-nasal space—Pars nasalis pharyngis
Cushion of the Eustachian orifice—Torus tubarius
Soft palate, or velum pendulum palati—Velum palatinum
Basilar portion or process of the occipital bone, or basi-occipital—Pars basilaris ossis occipitalis

FIG. 1477.—HORIZONTAL SECTION THROUGH THE LOWER PART OF THE NASAL FOSSÆ AND THE MAXILLARY SINUSES, OR ANTRA OF HIGHMORE, AND THROUGH THE NASAL PART OF THE PHARYNX, NASOPHARYNX, OR POST-NASAL SPACE. THE LOWER SEGMENT VIEWED FROM ABOVE. THE SECTION PASSES THROUGH THE NECK OF THE LOWER JAW-BONE, AND THROUGH THE BASILAR PORTION OR PROCESS OF THE OCCIPITAL BONE, OR BASI-OCCIPITAL, IMMEDIATELY ABOVE THE FORAMEN MAGNUM. IN THE REGION OF THE NASAL FOSSÆ THE PLANE OF SECTION PASSES THROUGH THE ANTERIOR AND POSTERIOR EXTREMITIES OF THE INFERIOR TURBINAL OR TURBINATE BODY: THE LOWER SEGMENT OF THE LATTER HAS BEEN REMOVED, SO THAT THE FLOOR OF THE NASAL FOSSÆ IS EXPOSED THROUGHOUT ITS WHOLE EXTENT AS WELL AS THE LOWER PART OF THE OUTER WALL. ON THE LEFT SIDE OF THE SEPTUM OF THE NOSE A *LATERAL CREST, *CRISTA LATERALIS SEPTI (VARIETY—*see Appendix, note* 555), IS MET WITH. IN THE NASOPHARYNX THE SECTION TRAVERSES ON EACH SIDE THE PHARYNGEAL ORIFICE OF THE EUSTACHIAN TUBE, THE CUSHION OF THE EUSTACHIAN ORIFICE (TORUS TUBARIUS), AND THE LATERAL RECESS OF THE PHARYNX, OR FOSSA OF ROSENMÜLLER.

[1] See note 3 to p. 942. [2] See Appendix to Part IV., note 4. [3] See Appendix, note 555.
[4] *Tenth cranial nerve* in Soemmerring's enumeration; *second trunk* of the *eighth cranial nerve* in that of Willis.
[5] *Twelfth cranial nerve* in Soemmerring's enumeration, *ninth* in that of Willis; also known as the *lingual motor nerve.*
[6] See Appendix to Part V., note 261.

Cavum nasi—The nasal fossæ.

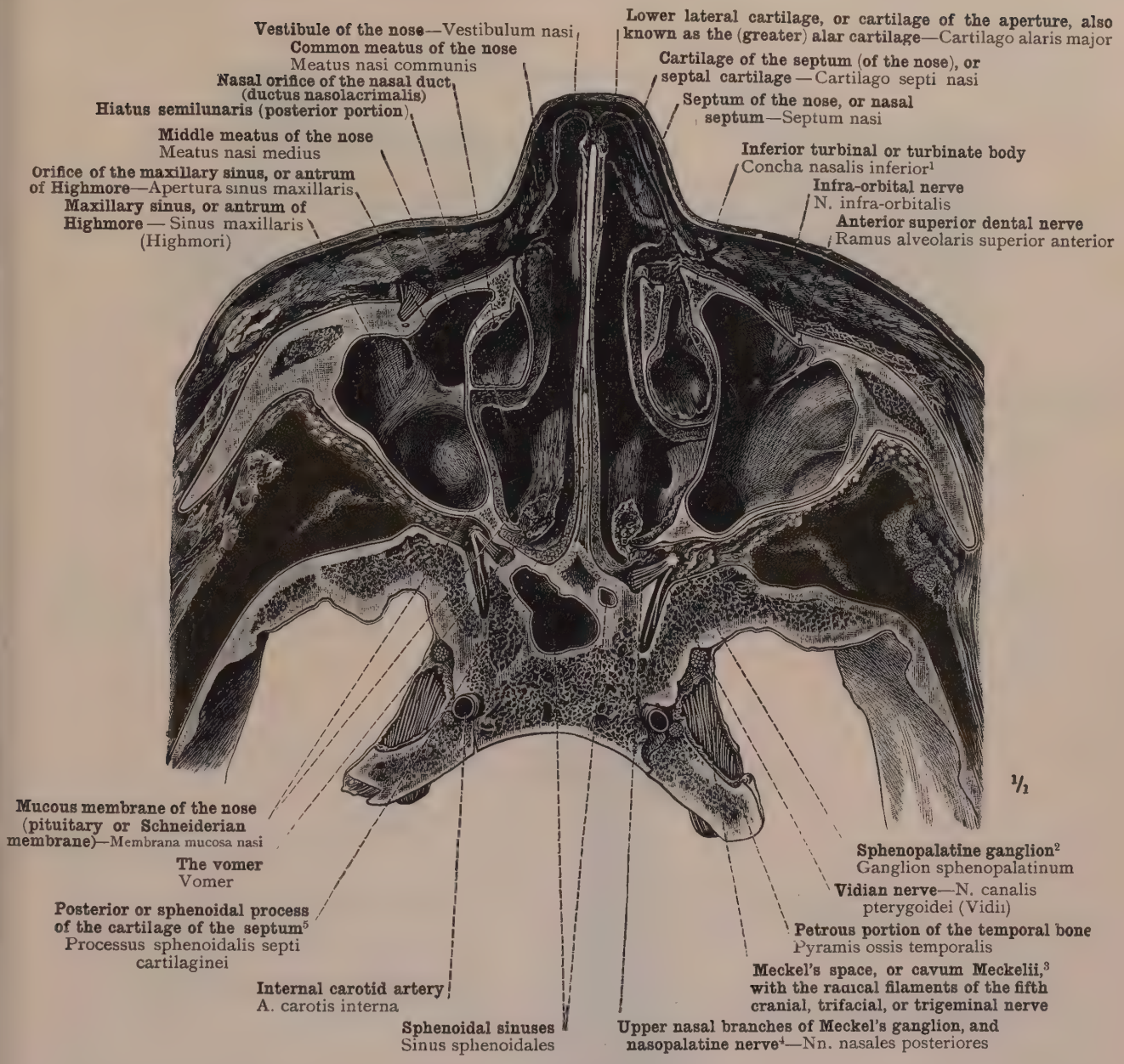

Vestibule of the nose—Vestibulum nasi
Common meatus of the nose
Meatus nasi communis
Nasal orifice of the nasal duct (ductus nasolacrimalis)
Hiatus semilunaris (posterior portion)
Middle meatus of the nose
Meatus nasi medius
Orifice of the maxillary sinus, or antrum of Highmore—Apertura sinus maxillaris
Maxillary sinus, or antrum of Highmore — Sinus maxillaris (Highmori)
Lower lateral cartilage, or cartilage of the aperture, also known as the (greater) alar cartilage—Cartilago alaris major
Cartilage of the septum (of the nose), or septal cartilage — Cartilago septi nasi
Septum of the nose, or nasal septum—Septum nasi
Inferior turbinal or turbinate body
Concha nasalis inferior[1]
Infra-orbital nerve
N. infra-orbitalis
Anterior superior dental nerve
Ramus alveolaris superior anterior
1/1
Mucous membrane of the nose (pituitary or Schneiderian membrane)—Membrana mucosa nasi
The vomer
Vomer
Posterior or sphenoidal process of the cartilage of the septum[5]
Processus sphenoidalis septi cartilaginei
Internal carotid artery
A. carotis interna
Sphenoidal sinuses
Sinus sphenoidales
Sphenopalatine ganglion[2]
Ganglion sphenopalatinum
Vidian nerve—N. canalis pterygoidei (Vidii)
Petrous portion of the temporal bone
Pyramis ossis temporalis
Meckel's space, or cavum Meckelii,[3] with the radical filaments of the fifth cranial, trifacial, or trigeminal nerve
Upper nasal branches of Meckel's ganglion, and nasopalatine nerve[4]—Nn. nasales posteriores

FIG. 1478.—OBLIQUE SECTION THROUGH THE NASAL FOSSÆ, DESCENDING AS IT PASSES FORWARDS, IN A PLANE ALMOST PARALLEL WITH THAT OF THE INFERIOR WALLS OF THE ORBITS. THE UPPER SEGMENT VIEWED FROM BELOW. BEHIND, THE SECTION SHOWS THE MIDDLE MEATUS; IN FRONT, THE INFERIOR MEATUS AND THE VESTIBULE OF THE NOSE. OF THE ACCESSORY CAVITIES OF THE NOSE, THE MAXILLARY SINUSES OR ANTRA OF HIGHMORE ARE CUT ACROSS IN THEIR GREATEST WIDTH, SO THAT THEIR ROOFS ARE FULLY DISPLAYED; WHILE THE SPHENOIDAL SINUSES ARE OPENED CLOSE TO THEIR LOWER EXTREMITIES. IN THE REGION OF THE SPHENOMAXILLARY FOSSA, THE UPPER PART OF WHICH TOGETHER WITH THE SPHENOPALATINE FORAMEN, FORAMEN SPHENOPALATINUM, AND THE ANTERIOR HALF OF THE VIDIAN OR PTERYGOID CANAL, CANALIS PTERYGOIDEUS (VIDII), APPEARS IN THE PLANE OF SECTION, THE SPHENOPALATINE GANGLION, GANGLION SPHENOPALATINUM,[2] THE VIDIAN NERVE, NERVUS CANALIS PTERYGOIDEI, AND THE PROXIMAL PORTIONS OF THE UPPER NASAL BRANCHES OF THE SPHENOPALATINE GANGLION AND THE NASOPALATINE NERVE, NN. NASALES POSTERIORES (*see Appendix, note* 450), ARE VISIBLE.

[1] See note 5 to p. 944.
[2] Known also as *Meckel's ganglion* and as the *nasal ganglion.*
[3] See Appendix, note 558.
[4] See Appendix, note 450.
[5] See note 3 to p. 943.

Cavum nasi—The nasal fossæ.

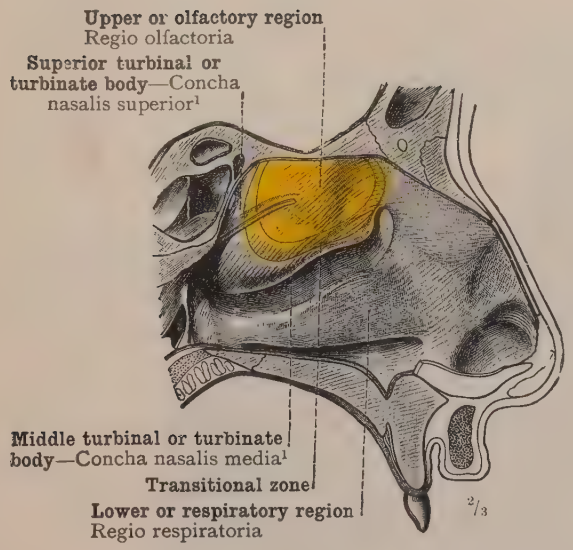


FIG. 1479.—LATERAL WALL OF THE LEFT NASAL FOSSA.

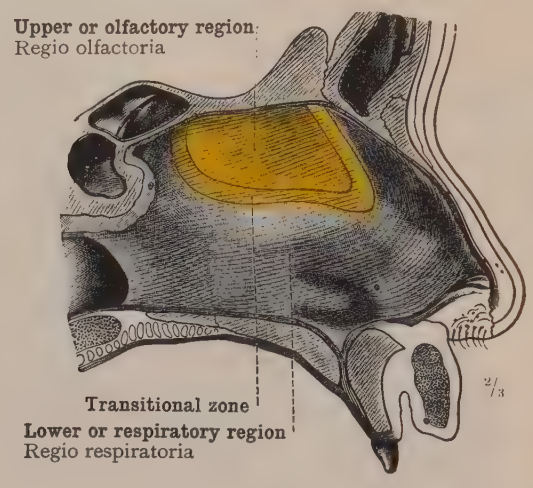


FIG. 1480.—MESIAL WALL OF THE RIGHT NASAL FOSSA.

THE DELIMITATION OF THE UPPER OR OLFACTORY AND THE LOWER OR RESPIRATORY REGIONS OF THE NOSE, WITH THE TRANSITIONAL ZONE, WHICH VARIES GREATLY IN DIFFERENT INDIVIDUALS. WITH REGARD TO THE RADIATION OF THE OLFACTORY NERVES, COMPARE FIGS. 1302 AND 1303.

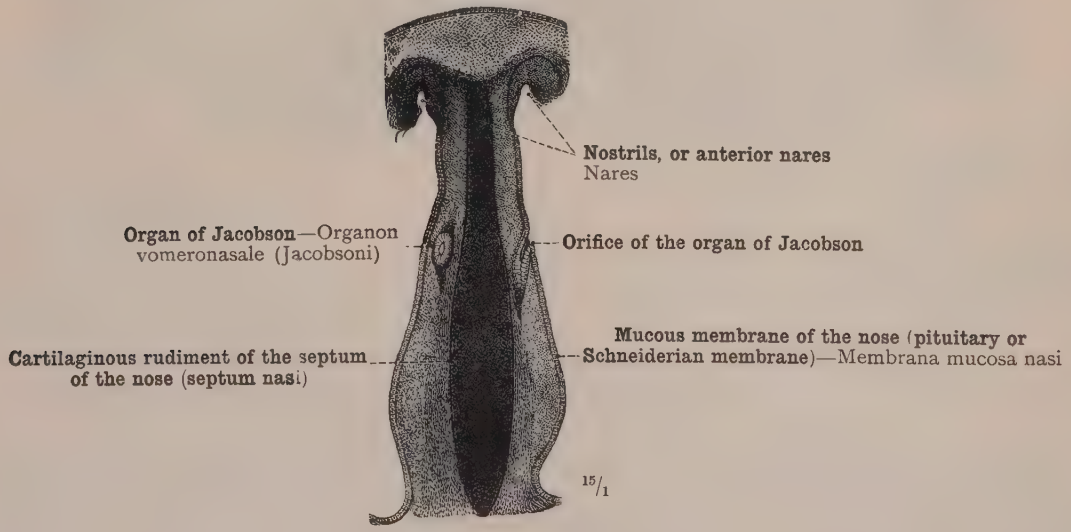

Nostrils, or anterior nares
Nares
Organ of Jacobson—Organon vomeronasale (Jacobsoni)
Orifice of the organ of Jacobson
Mucous membrane of the nose (pituitary or Schneiderian membrane)—Membrana mucosa nasi
Cartilaginous rudiment of the septum of the nose (septum nasi)
15/1

FIG. 1481.—THE ORGAN OF JACOBSON, ORGANON VOMERONASALE, OF A HUMAN FŒTUS IN THE FOURTH MONTH (MONTHS OF FOUR WEEKS EACH), HAVING A BODY-LENGTH OF 8·8 CENTIMETRES (3·465 INCHES), AS SEEN IN A HORIZONTAL SECTION THROUGH THE LOWER PORTION OF THE NASAL SEPTUM. ON THE LEFT SIDE THE CANAL IS DIVIDED OBLIQUELY; ON THE RIGHT SIDE ITS ORIFICE APPEARS IN THE PLANE OF SECTION.

[1] See note 5 to p. 944.

Cavum nasi—The nasal fossæ.

ORGANON TACTUS,

INTEGUMENTUM COMMUNE

THE ORGAN OF TOUCH,

THE SKIN

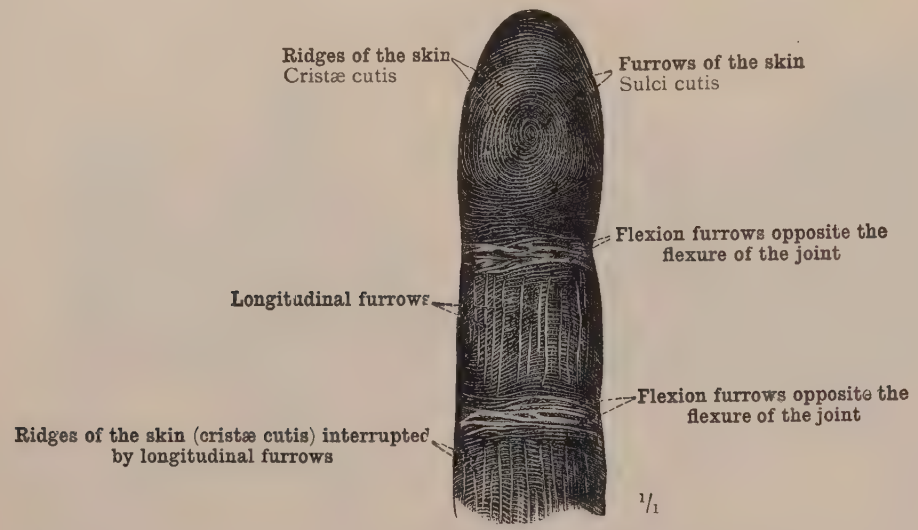

Ridges of the skin
Cristæ cutis
Furrows of the skin
Sulci cutis
Flexion furrows opposite the flexure of the joint
Longitudinal furrows
Flexion furrows opposite the flexure of the joint
Ridges of the skin (cristæ cutis) interrupted by longitudinal furrows
1/1

FIG. 1482.—THE FURROWS AND RIDGES OF THE SURFACE OF THE SKIN, REPRODUCED FROM AN IMPRESSION OF THE PALMAR SURFACE OF THE MIDDLE FINGER.

FIG. 1483.—THE FURROWS AND RIDGES OF THE TRUE SKIN, CUTIS VERA, OR CORIUM, ON THE PALMAR SURFACE OF ONE OF THE FINGERS, THE EPIDERMIS HAVING BEEN REMOVED. DRAWN WITH THE AID OF THE STEREOSCOPIC MICROSCOPE. ARRANGEMENT OF THE PAPILLÆ AND OF THE EFFERENT DUCTS OF THE SUDORIFEROUS GLANDS OR SWEAT GLANDS.

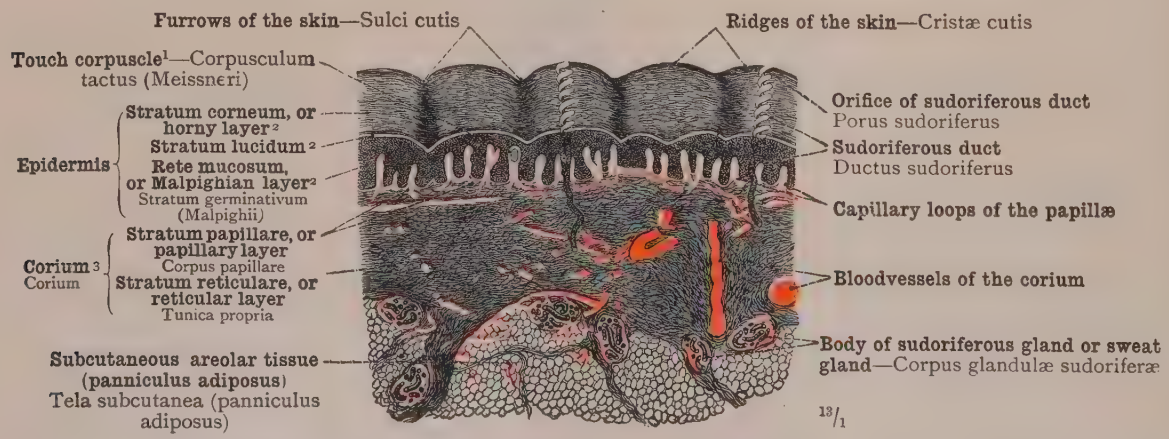


FIG. 1484.—VERTICAL SECTION THROUGH THE SKIN, CUTIS, OF THE FINGER-TIP. THE LAYERS OF THE EPIDERMIS[2] AND OF THE CORIUM.[3] THE SUBCUTANEOUS AREOLAR TISSUE, TELA SUBCUTANEA. THE SUDORIFEROUS OR SWEAT GLANDS.

The bloodvessels have been injected with red-coloured gelatine.

[1] See Appendix, note 324. [2] See Appendix, note 559. [3] The *corium* is also known as the *derma*, *cutis vera*, or *true skin*.

Cutis—The skin.

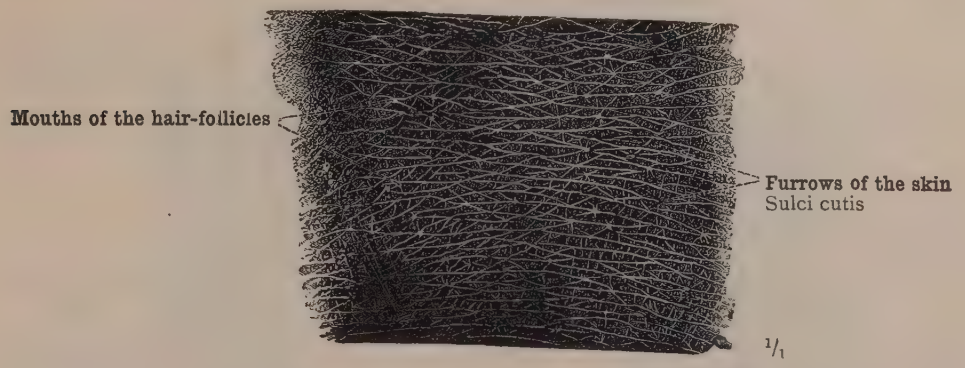


FIG. 1485.—THE FURROWS OF THE SKIN AND THE AREAS WHICH THESE FURROWS DELIMIT, REPRODUCED FROM AN IMPRESSION OF THE DORSAL SURFACE OF THE WRIST.

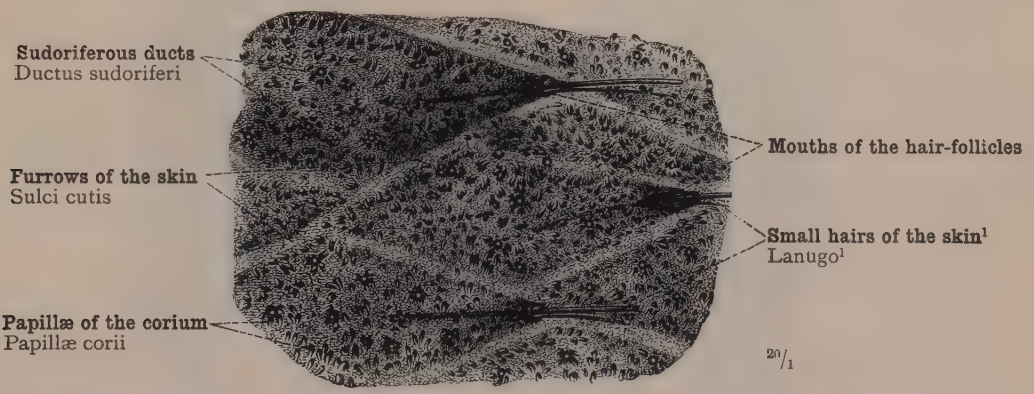


FIG. 1486.—THE FURROWS OF THE SKIN AND THE AREAS WHICH THESE FURROWS DELIMIT ON THE DORSAL SURFACE OF THE WRIST, AS DISPLAYED ON THE CORIUM WHEN THE EPIDERMIS HAS BEEN REMOVED. DRAWN WITH THE AID OF THE STEREOSCOPIC MICROSCOPE. THE ARRANGEMENT OF THE PAPILLÆ AND OF THE EFFERENT DUCTS OF THE SUDORIFEROUS GLANDS OR SWEAT GLANDS.

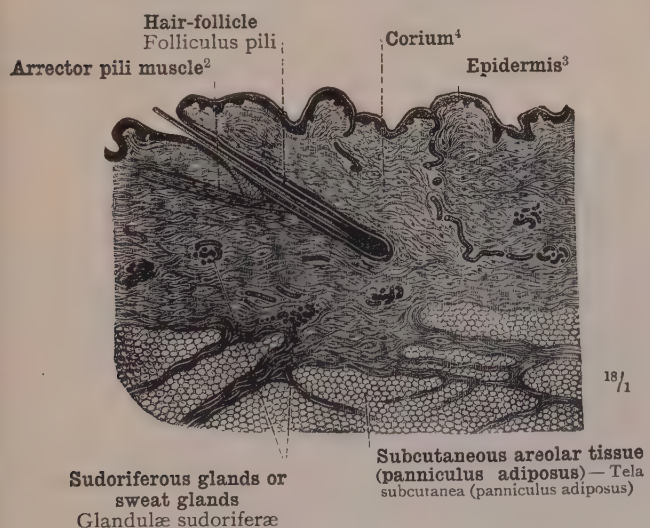


FIG. 1487.—VERTICAL SECTION THROUGH THE SKIN, CUTIS, OF THE TRUNK IN THE REGION OF THE ARCH OF THE RIBS. ONE OF THE SMALL HAIRS OF THE SKIN IS SEEN IN LONGITUDINAL SECTION. SUDORIFEROUS GLANDS OR SWEAT GLANDS AND THEIR EFFERENT DUCTS.

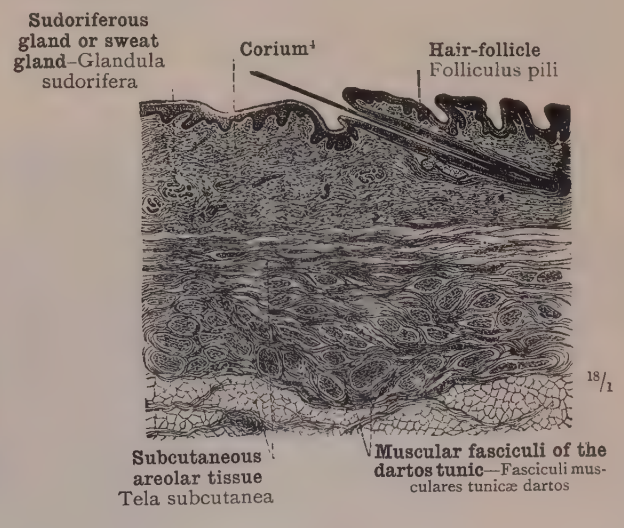


FIG. 1488.—VERTICAL SECTION THROUGH THE SKIN, CUTIS, AND THE DARTOS TUNIC, TUNICA DARTOS, OF THE SCROTUM. THE MUSCULAR FASCICULI OF THE LATTER ARE CUT ACROSS. ONE OF THE PUBIC HAIRS IS SEEN IN LONGITUDINAL SECTION. SUDORIFEROUS GLANDS OR SWEAT GLANDS.

1 Regarding the German use of the term *lanugo*, see Appendix, note 503.
2 By Macalister named *erector pili muscle*, but the form used in the text is that most generally employed.
3 See Appendix, note 559.
4 The *corium* is also known as the *derma*, *cutis vera*, or *true skin*.

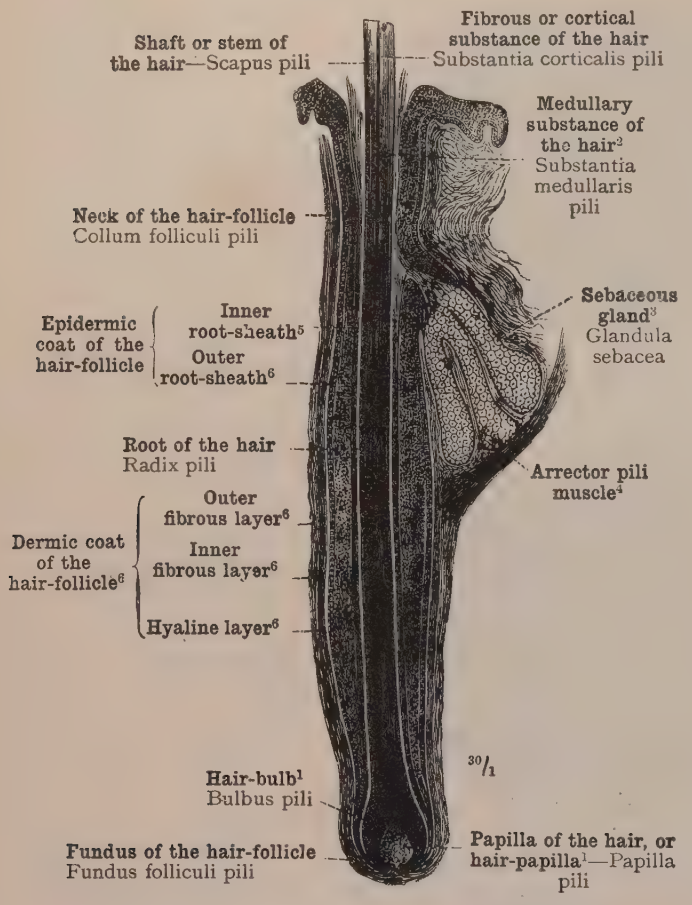

Shaft or stem of the hair—Scapus pili
Fibrous or cortical substance of the hair Substantia corticalis pili
Medullary substance of the hair[2] Substantia medullaris pili
Neck of the hair-follicle Collum folliculi pili
Sebaceous gland[3] Glandula sebacea
Epidermic coat of the hair-follicle
Inner root-sheath[5]
Outer root-sheath[6]
Root of the hair Radix pili
Arrector pili muscle[4]
Dermic coat of the hair-follicle[6]
Outer fibrous layer[6]
Inner fibrous layer[6]
Hyaline layer[6]
Hair-bulb[1] Bulbus pili
30/1
Fundus of the hair-follicle Fundus folliculi pili
Papilla of the hair, or hair-papilla[1]—Papilla pili

FIG. 1489.—A HAIR OF THE HEAD (CAPILLUS) STILL IN COURSE OF GROWTH, WITH HAIR-BULB, BULBUS PILI,[1] IN LONGITUDINAL SECTION. HAIR-FOLLICLE, SEBACEOUS GLAND OR FOLLICLE, GLANDULA SEBACEA, AND ARRECTOR OR ERECTOR PILI MUSCLE.

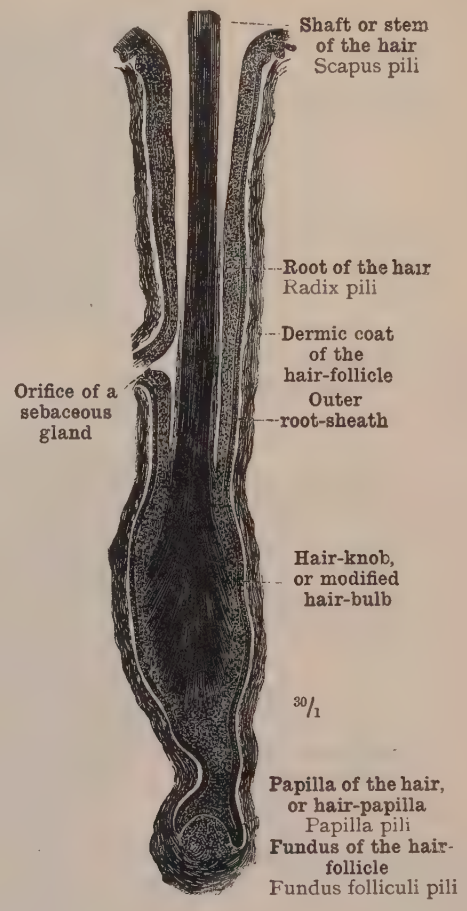

Shaft or stem of the hair Scapus pili
Root of the hair Radix pili
Dermic coat of the hair-follicle
Orifice of a sebaceous gland
Outer root-sheath
Hair-knob, or modified hair-bulb
30/1
Papilla of the hair, or hair-papilla Papilla pili
Fundus of the hair-follicle Fundus folliculi pili

FIG. 1490.—A HAIR OF THE HEAD (CAPILLUS) ABOUT TO BE SHED, WITH HAIR-KNOB OR MODIFIED HAIR-BULB,[1] IN LONGITUDINAL SECTION. HAIR-FOLLICLE, AND PAPILLA OF THE HAIR THAT IS ABOUT TO DEVELOP IN PLACE OF THE OLD ONE.

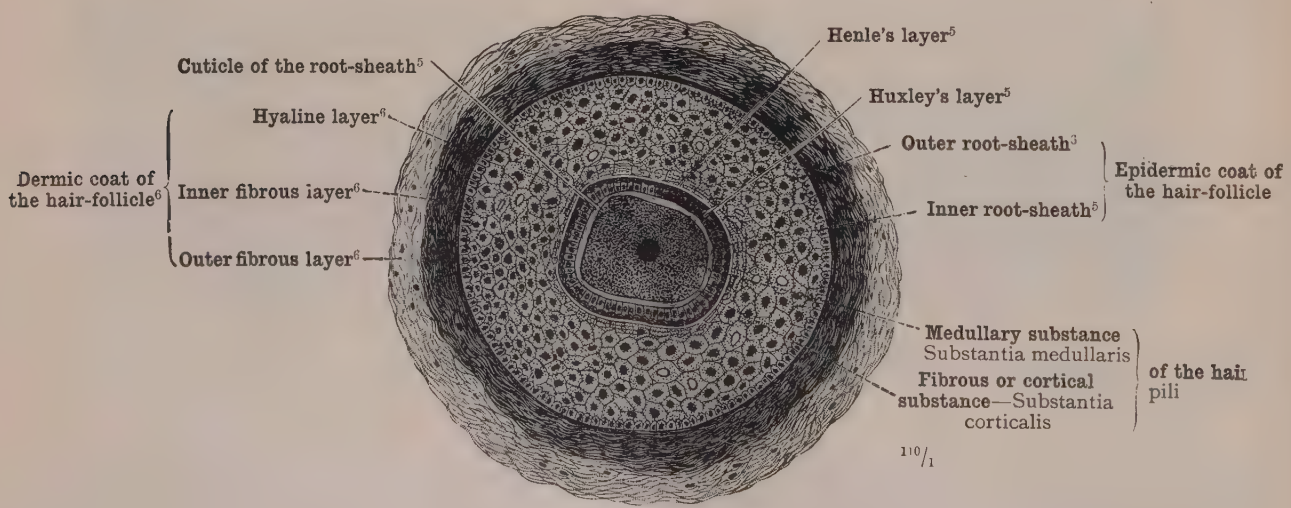


FIG. 1491.—A MOUSTACHE HAIR WITH ITS HAIR-FOLLICLE IN TRANSVERSE SECTION. THE LAYERS OF THE HAIR FOLLICLE (*see Appendix, notes* 561 *and* 562).

1 See Appendix, note 560.
2 Also called more shortly the *medulla* or *pith* of the hair.
3 Or *sebaceous follicle.*
4 See note 2 to p. 9[illegible]
5 See Appendix, note 561.
6 See Appendix, note 562.

FIG. 1492.—VERTICAL SECTION THROUGH THE SKIN OF THE ALA NASI. SEBACEOUS GLANDS OR FOLLICLES, GLANDULÆ SEBACEÆ, WITH THE SMALL HAIRS OF THE SKIN, LANUGO (*see Appendix, note* 503). SUDORIFEROUS GLANDS OR SWEAT GLANDS, GLANDULÆ SUDORIFERÆ. CROSS-STRIATED MUSCULAR FIBRES ENTERING THE SKIN.

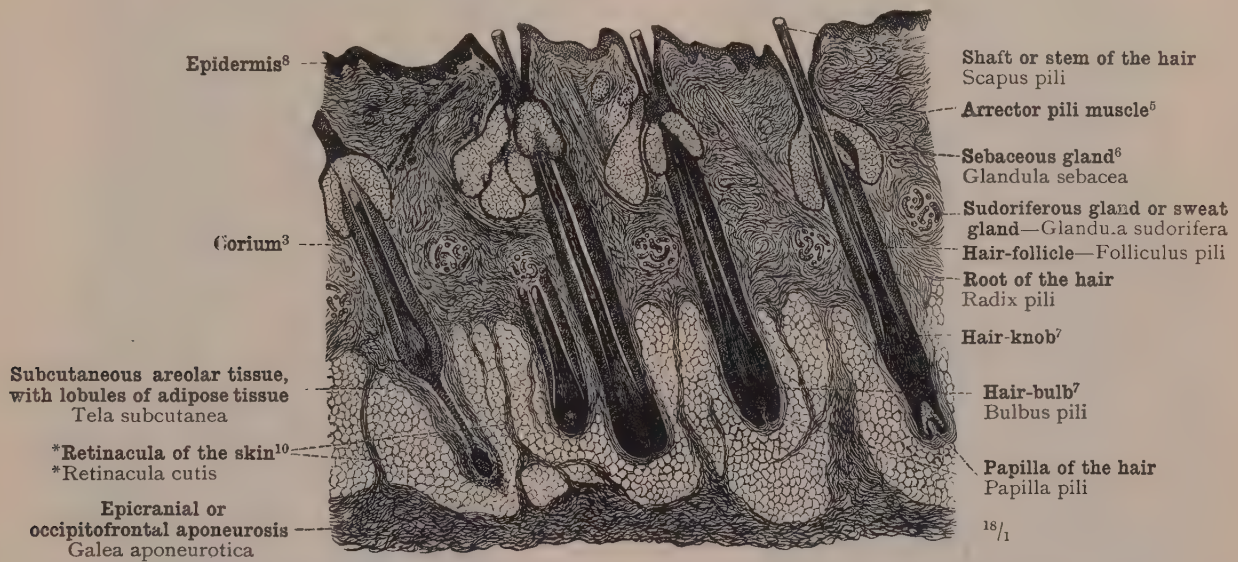


FIG. 1493.—VERTICAL SECTION THROUGH THE SKIN OF THE HEAD. HAIRS OF THE HEAD, CAPILLI, IN LONGITUDINAL SECTION, WITH SEBACEOUS GLANDS OR FOLLICLES AND MUSCLES OF THE HAIR-FOLLICLES, MUSCULI ARRECTORES *VEL* ERECTORES PILORUM. SUDORIFEROUS GLANDS OR SWEAT GLANDS.

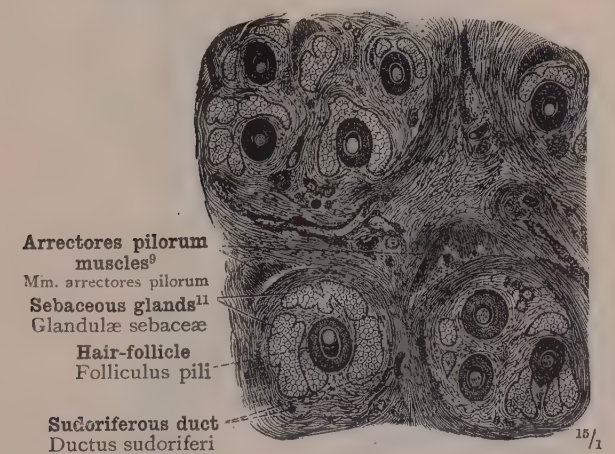


FIG. 1494.—HORIZONTAL SECTION THROUGH THE SKIN OF THE HEAD AT THE LEVEL OF THE SEBACEOUS GLANDS OR FOLLICLES. HAIR-FOLLICLES. FOLLICULI PILORUM, AND MUSCLES OF THE HAIR-FOLLICLES, MUSCULI ARRECTORES *VEL* ERECTORES PILORUM, IN OBLIQUE SECTION.

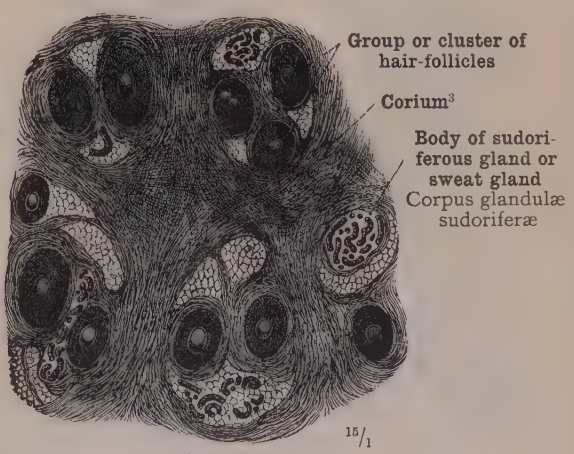


FIG. 1495.—HORIZONTAL SECTION THROUGH THE SKIN OF THE HEAD AT THE LEVEL OF THE SUDORIFEROUS GLANDS OR SWEAT GLANDS. HAIRS, CAPILLI, AND HAIR-FOLLICLES, FOLLICULI PILORUM, IN OBLIQUE SECTION.

1 See Appendix, note 559. 2 Regarding the German use of the term *lanugo*, see Appendix, note 503.
3 The *corium* is also known as the *derma cutis vera*, or *true skin*. 4 Or *sebaceous follicle*. 5 See note 2 to p. 951.
6 Or *sebaceous follicle*. 7 See Appendix, note 560. 8 See Appendix, note 559.
9 By Macalister named *erectores pilorum muscles*, but the form used in the text is that most generally employed.
10 See Appendix, note 563. 11 Or *sebaceous follicles*.

Pili—Hairs.—Glandulæ sebaceæ—Sebaceous glands or follicles.—Glandulæ sudoriferæ—Sudoriferous glands or sweat glands.

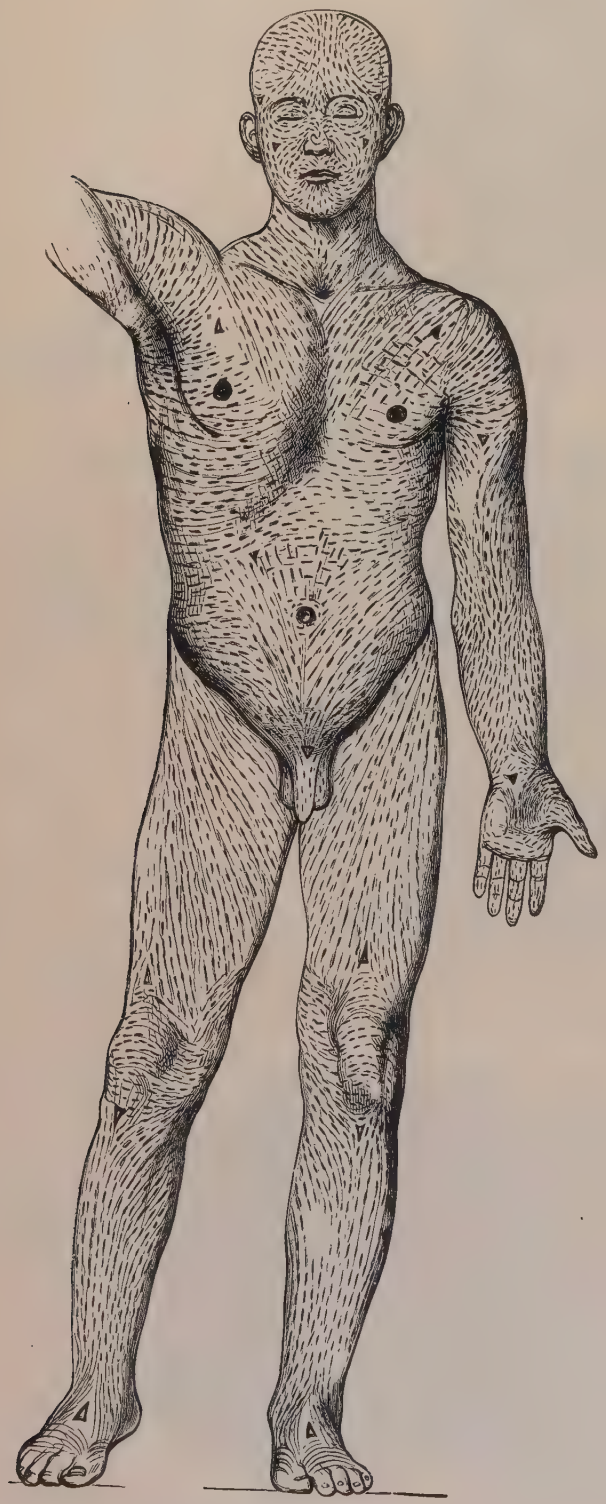


FIG. 1496.—ANTERIOR SURFACE.

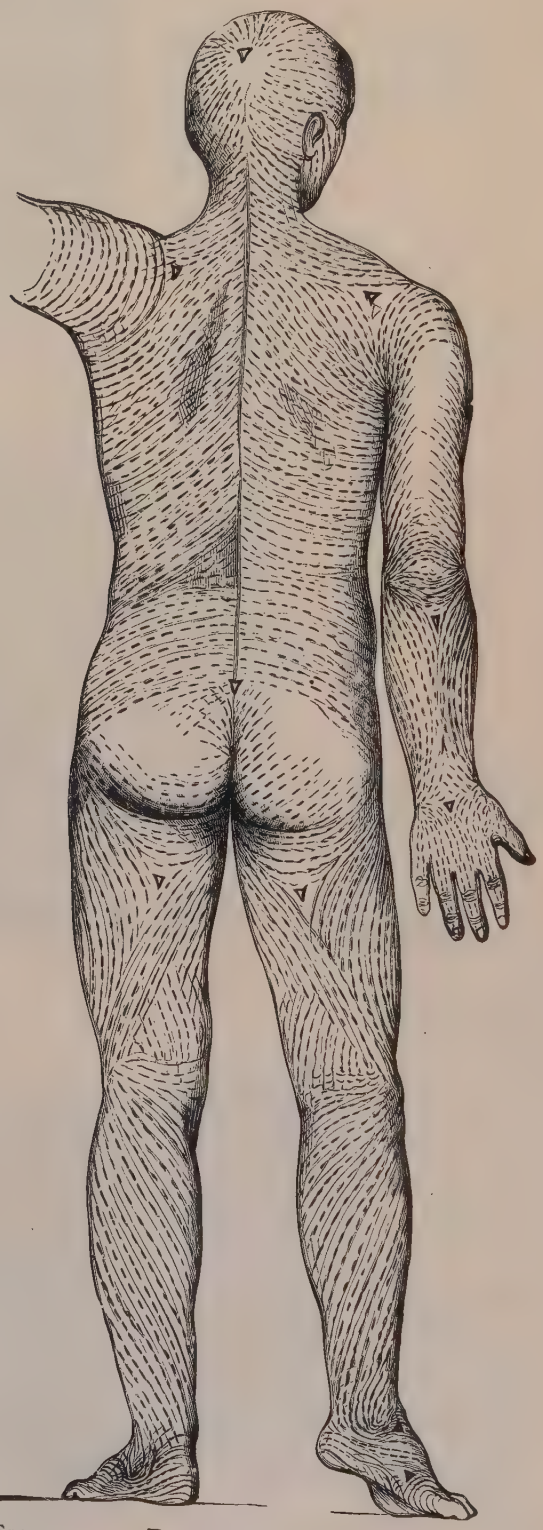


FIG. 1497.—POSTERIOR SURFACE.

THE GENERAL COURSE OF THE CONNECTIVE-TISSUE BUNDLES OF THE CORIUM, DETERMINED BY THE DIRECTION ASSUMED BY THE LINEAR CLEFTS MADE IN THE SKIN WHEN IT IS PUNCTURED BY A ROUND AWL.[1] (AFTER C. LANGER.)

[1] See Appendix, note 564.

Lines of Cleavage of the Skin.

FIG. 1498.—ANTERIOR SURFACE.

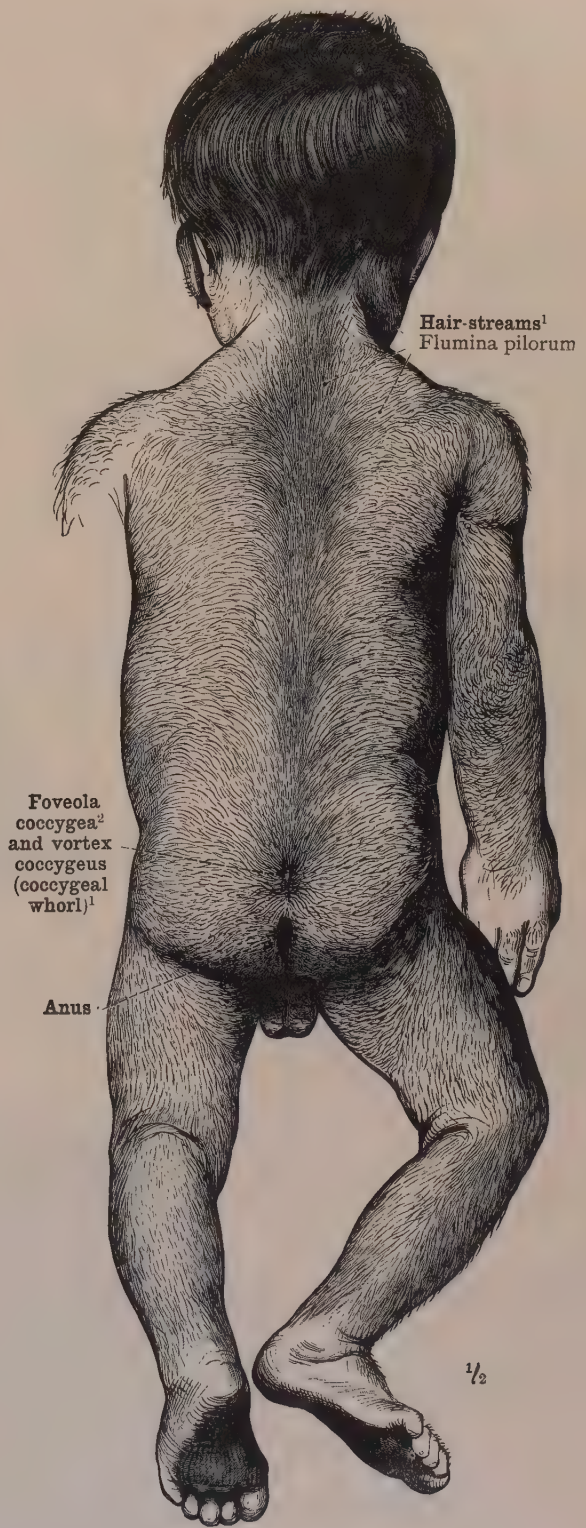


FIG. 1499.—POSTERIOR SURFACE.

THE DIRECTION OF THE HAIRS ON THE DIFFERENT PARTS OF THE BODY. FŒTUS IN THE NINTH MONTH OF INTRA-UTERINE LIFE (MONTHS OF FOUR WEEKS EACH).

1 See Appendix, note 564. 2 See note 3 to p. 528, in Part IV.

Hair-streams—Flumina pilorum.—Hair-whorls—Vortices pilorum *(see note 1 above)*.

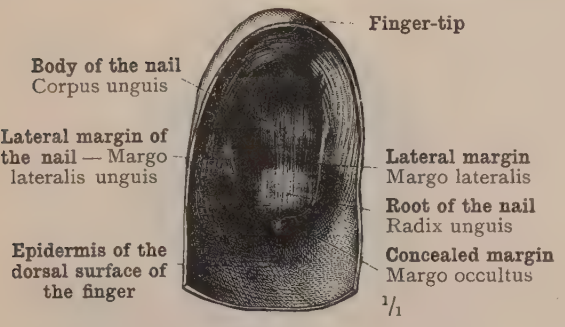


FIG. 1500.—THE FINGER-NAIL, WITH THE ADJOINING AREA OF EPIDERMIS, DETACHED FROM THE CORIUM BY THE ACTION OF SUPERHEATED STEAM. SEEN FROM THE CONCAVE SIDE.

FIG. 1501.—FINGER-NAIL, COMPLETELY ISOLATED. SEEN FROM THE CONVEX SIDE.

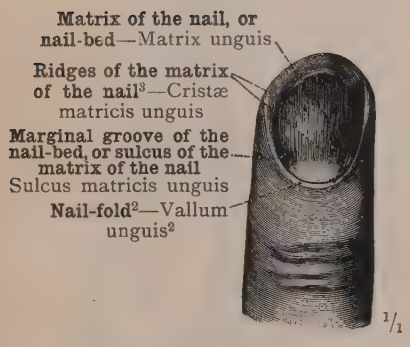

Matrix of the nail, or nail-bed—Matrix unguis
Ridges of the matrix of the nail[3]—Cristæ matricis unguis
Marginal groove of the nail-bed, or sulcus of the matrix of the nail
Sulcus matricis unguis
Nail-fold[2]—Vallum unguis[2]
1/1

FIG. 1502.—THE MATRIX OF THE NAIL OR NAIL-BED, MATRIX UNGUIS, WITH THE NAIL-FOLD AND NAIL-WALLS, VALLUM UNGUIS,[2] DISPLAYED BY THE REMOVAL OF THE EPIDERMIC PORTION OF THE NAIL OR NAIL PROPER AND THE SURROUNDING EPIDERMIS.

FIG. 1503.—MATRIX OF THE NAIL OR NAIL-BED, WITH PARTLY OPENED MARGINAL GROOVE OF THE NAIL-BED, SULCUS MATRICIS UNGUIS.

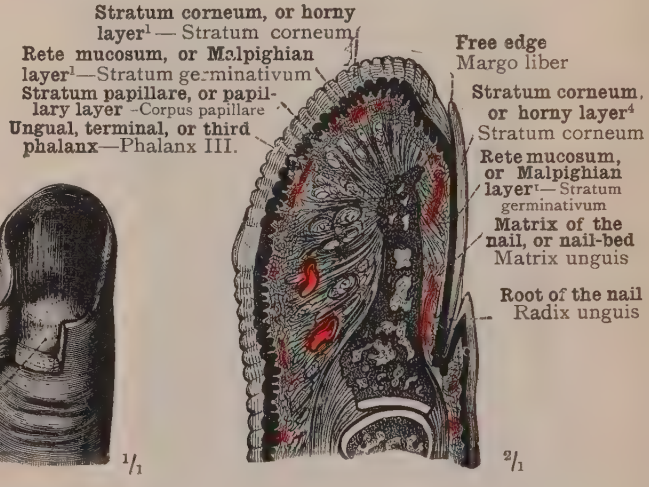

Stratum corneum, or horny layer[1] — Stratum corneum
Rete mucosum, or Malpighian layer[1]—Stratum germinativum
Stratum papillare, or papillary layer—Corpus papillare
Ungual, terminal, or third phalanx—Phalanx III.
Free edge
Margo liber
Stratum corneum, or horny layer[4]
Stratum corneum
Rete mucosum, or Malpighian layer[1]—Stratum germinativum
Matrix of the nail, or nail-bed
Matrix unguis
Root of the nail
Radix unguis
2/1

FIG. 1504.—LONGITUDINAL SECTION THROUGH THE NAIL AND THE TERMINAL PORTION OF THE MIDDLE FINGER.

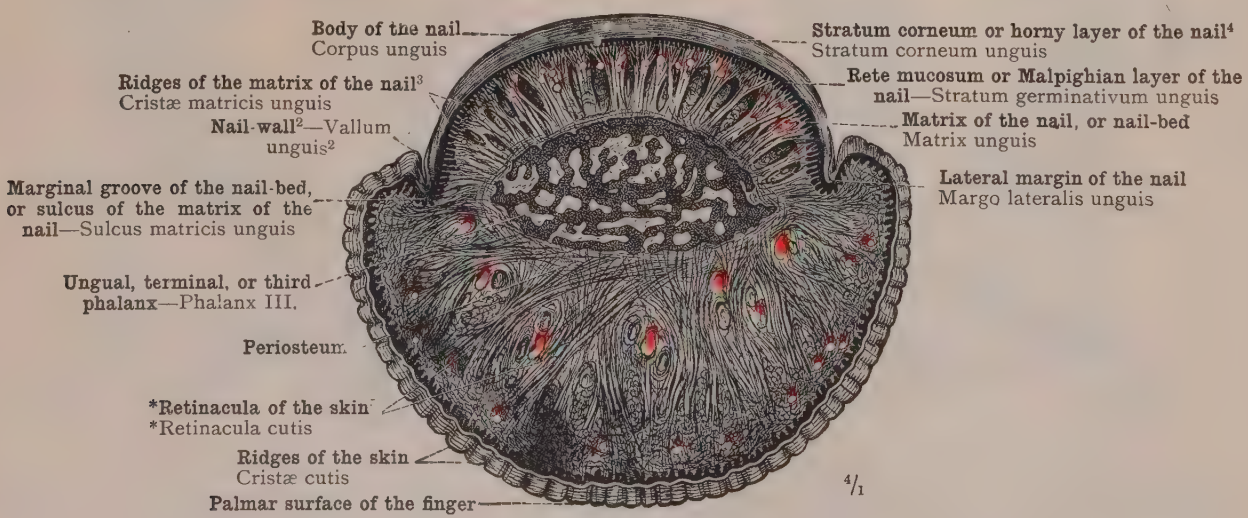

Body of the nail
Corpus unguis
Ridges of the matrix of the nail[3]
Cristæ matricis unguis
Nail-wall[2]—Vallum unguis[2]
Marginal groove of the nail-bed, or sulcus of the matrix of the nail—Sulcus matricis unguis
Ungual, terminal, or third phalanx—Phalanx III.
Periosteum.
*Retinacula of the skin
*Retinacula cutis
Ridges of the skin
Cristæ cutis
Palmar surface of the finger
Stratum corneum or horny layer of the nail[4]
Stratum corneum unguis
Rete mucosum or Malpighian layer of the nail—Stratum germinativum unguis
Matrix of the nail, or nail-bed
Matrix unguis
Lateral margin of the nail
Margo lateralis unguis
4/1

FIG. 1505.—TRANSVERSE SECTION THROUGH THE NAIL AND THE TERMINAL PORTION OF THE RING FINGER.

[1] See Appendix, note 559. [2] See Appendix, note 566.
[3] The *ridges of the matrix* of the nail are, according to Quain (*op. cit.*, vol. iii., part iii., p. 418), "sometimes, and perhaps more suitably, named *laminæ*."
[4] See Appendix, note 567. [5] See Appendix, note 563.

APPENDIX TO PART VI.

NOTES BY TRANSLATOR

[318] *Neurilemma* (Figs. 1125, 1126, p. 746).—This forms the outermost covering of the medullated nerve fibres, and exhibits nuclei disposed at regular intervals along its inner surface. Since similar nuclei are seen also on the surface of the non-medullated nerve fibres, it is generally believed that these latter fibres also are invested with neurilemma (see Fig. 1126). As Ranvier, however, pointed out, it is difficult if not impossible to demonstrate the supposed sheath of the non-medullated fibres, and for this reason some histologists believe that the nuclei are imbedded in the peripheral layer of the fibre itself, and that the sheath is non-existent. The *neurilemma* or *neurolemma* (Quain prefers the latter spelling, which is, however, less often used than the former) is also known as the *primitive sheath*, or *sheath of Schwann*. It may be well to point out that the term *neurilemma* was formerly used to denote "the connective-tissue sheath wrapping round the whole nerve" (Foster), or "the connective-tissue sheath of the funiculus [see note [320] below], which is now known as the perineurium" (Quain); but, as Foster remarks ("Physiology," 5th ed., p. 115), "it seemed undesirable to use two such analogous terms as sarcolemma and neurilemma for two things obviously without analogy, and hence neurilemma is now used for that part of the nerve which is obviously analogous to the sarcolemma in muscle, viz., the sheath of the fibre."

[319] *Medullated and Non-Medullated Nerve Fibres* (Figs. 1124-1126, p. 746.)—Nerve fibres are distinguished as *medullated* and *non-medullated* respectively according to the presence or absence of the *medullary sheath* (*white substance* of Schwann). Medullated fibres are known also as *double-bordered*, *double-contoured*, or *white* fibres; non-medullated fibres are known also as *pale* fibres; often, also, after their discoverer, they are termed *fibres of Remak*.

[320] *Epineurium*, *Perineurium*, *and Endoneurium* (Fig. 1127, p. 746).—The peripheral nerves are invested by a *common sheath* of fibrous tissue (formerly known as the *cellular sheath*); from this sheath, septa of connective tissue pass inwards between the *secondary bundles* or *funiculi*, of which all but the very smallest peripheral nerves contain a plural number. The common sheath and the septa just mentioned constitute the *epineurium*, in which the minute vessels and nerves (*nervi nervorum*) for the nutrition and sensibility of the nerve trunk ramify. Each *funiculus* or *secondary bundle* contains a variable number of nerve fibres, and has therefore no determinate size; it is enclosed in a tubular sheath of connective tissue, known as the *perineurium*. Whereas the epineurium is fibrous in character, the perineurium is distinctly lamellar, and may be separated in the form of a tube from the bundle of fibres which it invests. From its inner surface septa pass inwards among the nerve fibres, dividing them into *primary bundles*, and these septa are continuous with, and are usually described as forming part of, the *endoneurium*, which, for the rest, consists of delicate fibrils of connective tissue, for the most part longitudinally disposed, enmeshing and supporting the individual nerve fibres. In the larger nerve trunks, which contain numerous funiculi, these branch and reunite in a plexiform manner. The *epineurium* and *perineurium* were formerly known indifferently as *neurilemma*; the reason for abandoning this nomenclature is given at the end of note [318] above. The author does not make use of the term *epineurium*, and would seem in these figures to disregard altogether the *common sheath* of the nerves. Fig. 1127 is said to depict "a portion of the median nerve." As this "portion" is surrounded by laminated perineurium, it is, doubtless, part of a single funiculus, dissected out of the nerve trunk.

[321] *Recent Advances in the Histology of Nervous Tissue* (Figs. 1128 to 1131, p. 747).—As a result of recent investigations into the minute structure of the nervous system, more especially those of Golgi and Ramón y Cajal, certain new conceptions regarding that structure have arisen, accompanied by a new nomenclature, in exposition of which I quote the following passage from the fourth edition of Halliburton's "Physiology," pp. 195, 196: "The whole nervous system consists of nerve cells and their branches, supported by neuroglia in the central nervous system, and by connective tissue in the nerves. Some of the processes of a nerve cell break up almost immediately into smaller branches, ending in arborescences of fine twigs; these branches, which used to be called protoplasmic processes, are now termed *dendrons*, and the fine twigs *dendrites;* one branch becomes the long axis-cylinder of a nerve fibre, but it also ultimately terminates in an arborization. It is called the *axis-cylinder process*, or, more briefly, the *axon*. The term *neuron* is applied to the complete nerve unit—that is, the body of the cell, and all its branches. Some observers have supposed that the axis-cylinder process is the only one that conducts nerve impulses, the dendron being rootlets which suck up nutriment for the nerve cell. This exclusive view has not, however, been generally accepted; the dendrons may be nutritive, but it is believed that they also, like the rest of the nerve unit, are concerned in the conduction of nerve impulses. A strong piece of evidence in this direction is the fact that the fibrils of the axis-cylinder may be traced through the body of the cell into the dendrons.

"The next idea which it is necessary to grasp is, that each nerve unit (cell *plus* branches of both kinds) is anatomically independent of every other nerve unit. There is no anastomosis of the branches from one nerve cell with those of another; the arborizations interlace and intermingle, and nerve impulses are transmitted from one nerve unit to another, but not by continuous structures. The impulses are transmitted through contiguous, but not through continuous, structures. A convenient expression for the intermingling of arborizations is *synapse* (literally, a clasping)." The axis-cylinder process, or axon, was originally supposed to be unbranched, but Golgi's chromate of silver method, by means of which the nerve fibrils may be followed to their finest ramifications, has demonstrated that this view was erroneous, and that lateral branches invariably pass from the axon into the adjacent nerve tissue. These branches are known as *collaterals*.

[322] *Plexus and Network* (Fig. 1132, p. 748).—I employ the phrase *terminal network* as the literal translation of the German word *Endnetz*, which is used by the author in the original. It is, however, a moot point whether this terminal ramification of the sensory nerves of the cornea is a true *network* or merely a *plexus*. The fact that the slender filaments exhibit no varicosities at their points of junction suggests rather the latter conclusion. The distinction between a *nervous network* and a *nervous plexus* is explained by Quain in the following terms ("Anatomy," 10th ed., vol. i., part ii., p. 347): "In the former an actual fusion of the ultimate fibrillæ which result from the division of the axis-cylinders of the nerves is assumed to take place, whereas in the latter, although there may appear to be an intimate union between the different nerves which enter into the plexus, this union does not extend to the ultimate elements of the nerve fibre; in other words, although fibres or parts of fibres (fibrils) may be given and received by the several nerves to and from one another, these fibres (in the case of the larger plexuses) or fibrils (in the microscopic plexuses) remain completely distinct, although they may run in close juxtaposition. Nervous plexuses are of very common occurrence, both those of the larger sort which have long been recognised by anatomists, and the smaller microscopic plexuses which are often found near the endings, both of some centripetally conducting and of some centrifugally conducting nerves. But nervous networks are far less frequent than has been supposed, although they were until lately described as a mode of nerve termination not by any means rare; and, indeed, their existence is now doubted altogether by some histologists."

[323] *Free Ends of Corneal Nerves* (Fig. 1133, p. 748).—It is a disputed point whether sensory nerve terminals ever actually penetrate the cells of the tissue to which they are distributed. In his description of Fig. 1133, the author shelves the question by stating that "the nerve fibrils end freely in the epithelium" (*freie Endigung der Nervenfibrillen im Epithel*), which may signify either *between* the cells of the epithelium or *in the interior* of these cells. Concerning this matter Quain writes (*op. cit.*, vol. iii., part iii., p. 23): "An actual connexion of these nerves with the corpuscles of the cornea probably never occurs; although, since the fine nerve fibrils run in the anastomosing cell spaces, they come into close connexion with the corpuscles and their processes, and they have therefore been described by some observers as being actually continuous with the latter." (The passage as written is, unfortunately, to some degree ambiguous, owing to the repetition of the word *connexion* in a changed sense; it is obvious, however, that in the second instance *contact* is denoted.)

[324] *Touch Corpuscles* (Fig. 1134, p. 749).—Also known as *tactile corpuscles* (*corpuscula tactis*) or *touch bodies*. In Germany they are distinguished as *Meissner'sche Tastkörperchen*, Meissner, with Thomas Wagner, having been their discoverer.

[325] *Pacinian Corpuscles* (Fig. 1137, p. 749).—Called also *Pacinian bodies*, and sometimes *corpuscles of Vater*. They were described by Vater in 1741; but their internal structure and their necessary connexion with nerve fibres was first demonstrated, at a much later date, by Pacini.

[326] *Henle's Sheath* (Figs. 1134 to 1137, p. 749).—This sheath is not mentioned by the author. It is derived from the *perineurium* (see note [320] above), which accompanies the nerves as they subdivide, and ultimately, in the finest branches, becomes reduced to a single lamella of connective tissue, covered within and without by a pavement epithelium (endothelium). Its importance in this connexion depends on the fact that the nucleated connective-tissue capsules of all the tactile end-organs are continuous with and derived from the sheath of Henle. A prolongation of this sheath passes over the motorial end-organs, also forming a nucleated covering called by Kühne the *telolemma* (*epilemma* according to Macalister); further, the *neurilemma* or *sheath of Schwann* being continuous with the sarcolemma, the motorial end-organ has a second covering within that derived from the sheath of Henle; this is sometimes called the *endolemma*.

[327] *Olivary Body* (Figs. 1141, 1143, p. 752).—This is called by Quain the *lower olive*. As far as human descriptive anatomy is concerned, the qualification is perhaps superfluous, the *superior olivary nucleus*, from which it is thus distinguished, being situated in man deep within the substance of the pons Varolii, and not giving rise to any superficial prominence similar to that from which the *lower olive* derives its name. In their internal structure, however, and in the size of their cells, the *superior* and the *inferior olive* exhibit, even in man, close resemblances; and in some animals, in which the superior olivary nucleus is proportionately much larger than in the case of the human brain, the outline of this body is distinctly sinuous, a fact which makes the similarity to the *corpus dentatum* of the inferior olive even more striking.

[328] *Pyramids* (Fig. 1141, p. 752).—These are sometimes called the *anterior pyramids* to distinguish them from the *posterior pyramids*, an alternative name (seldom employed) for the *funiculi graciles* with their *clavæ*.

[329] *Enlargements of the Spinal Cord* (Figs. 1141, 1142, p. 752).—These are variously named (1) *cervical* and *lumbar*, from the regions of the cord in which they are respectively situated; (2) *brachial* and *crural*, from the functions they respectively subserve; and (3) *upper* and *lower*, from their relative position. The names first mentioned are those in general use.

[330] *White Columns of the Spinal Cord* (Figs. 1141 to 1143, p. 752).—The posterior grey column (posterior horn—see note [339] below) almost reaches the surface of the cord along the postero-lateral groove (see note [53] below) and the line of attachment of the posterior root, thus distinctly separating the *posterior white column* from the rest of the cord; the anterior extremity of the anterior grey column (anterior horn), on the other hand, is some distance from the surface, and the bundles of the anterior nerve roots do not emerge along a defined vertical line, so that there is no distinct boundary between the *anterior* and the *lateral white column*. For this reason many anatomists divide the white matter of the cord into *posterior* and *anterolateral white columns* only.

[331] *Medulla Oblongata* (Fig. 1142, p. 752).—Quain gives *spinal bulb* as an alternative name, but the term is not in use; it is a translation of the Latin *bulbus rhachiticus*, a name used by Meckel.

[332] *Posterior Median Groove* (Figs. 1141, 1142, p. 752).—It will be noticed that the author speaks of the *sulcus medianus posterior* in contradistinction to the *fissura mediana anterior*. In England the terms *anterior* and *posterior median fissure* are in common use. The author's terminology is, however, to be preferred, for the anterior cleft only, though much shallower than the posterior, is a true fissure, both sides of which are lined with pia mater. Along the posterior median line of the cord is a shallow groove merely, the *posterior median groove*, from the bottom of which a cleft extends inwards nearly to the centre of the cord. This cleft is occupied, not by the pia mater, but by a thin stratum of connective tissue and bloodvessels connected with that membrane, known as the *posterior median septum* (see Fig. 1149, p. 755).

[333] (Fig. 1143, p. 752.) The terms *pars cervicalis*, *pars thoracalis*, and *pars lumbalis* (*cervical*, *dorsal*, and *lumbar portions* of the cord), as used by the author, refer to the divisions of the cord occupying respectively the cervical, dorsal, and lumbar portions of the spinal canal, and have no bearing on the *functional* divisions of the cord, represented by the *cervical* or *brachial* and *lumbar* or *crural enlargements*, and the intermediate *dorsal portion* of the cord (see note [329] above).

[334] *Medulla Spinalis*.—The term *spinal marrow*, a literal translation of the Latin term *medulla spinalis*, is still found in the text-books as an alternative name for the *spinal cord*.

[335] *Sulcus Lateralis Anterior et Posterior; Sulcus Intermedius Anterior et Posterior* (Figs. 1144 and 1145, p. 753).—"An *antero-lateral groove* has sometimes been described in the line of origin of the anterior roots of the nerves, but usually has no real existence. The fibres of these roots, in fact, unlike the posterior, do not dip into the spinal cord in one narrow line, but spread over a space of some breadth" (Quain, *op. cit.*, vol. iii., part i., p. 7). The *postero-lateral groove*, on the other hand, is a clearly marked furrow corresponding with the line of attachment on each side of the posterior roots of the spinal nerves. (See also note [330] above.) In the upper part of the cord a furrow is seen on either side about 1 millimetre from the posterior median groove (see note [332] above); this, which is better marked in some individuals than in others, is known as the *posterior intermediate groove* (or *furrow*); it serves, in the cervical region, to mark off the *postero-mesial* from the *postero-lateral* column (see note [348] below); from the bottom of the groove an incomplete septum of connective tissues analogous to the posterior median septum, and known as the *posterior intermediate septum*, extends into the substance of the cord between the columns just named (see Fig. 1149, p. 755). An *anterior intermediate groove* (or *furrow*), *sulcus intermedius anterior*, is shown in Fig. 1144 as a variety.

[336] *Fossa Rhomboidea* (Fig. 1145, p. 753).—According to Quain, this (or, strictly speaking, the term *fossa rhomboidalis*—see note [355] below) is an alternative name for the *fourth ventricle*, but by the author its signification is limited to the floor of that cavity. The part of the ventricle seen in Fig. 1145, viz., its pointed lower extremity, is known as the *calamus scriptorius*, on account of its resemblance to a writing-pen. (See also Fig. 1178, p. 768.)

[337] *Tuberculum Cuneatum* (Ibid.).—"On a level with the adjoining clava of the funiculus gracilis, the enlarged part of the cuneate funiculus also, like that, exhibits a slight eminence, which is best marked in children, and has been called the *cuneate tubercle*" (Schwalbe, quoted by Quain, *op. cit.*, vol. iii. part i., p. 44).

[338] **Terminal Ventricle* (Fig. 1146, p. 753).—"At the apex of the *conus medullaris* the central canal of the cord is considerably enlarged, to form what is known as the *ventriculus terminalis*, and below this, narrowing once more, it may be traced for some distance in the interior of the filum terminale" (Von Langer and Toldt's "Anatomy," 7th ed., p. 584). This term is not used by Quain or Macalister.

[339] *Grey Columns of the Spinal Cord* (Fig. 1147, p. 754).—It is to some extent an innovation in English anatomical nomenclature to employ the term *column* in speaking of the grey matter. The author, it will be noted, distinguishes the *white columns* as *funiculi* from the *grey columns*, which he terms *columnæ*. In England the grey matter of the spinal cord is, as a rule, divided into three *horns—anterior* or *ventral*, *posterior* or *dorsal*, and *lateral horn*—on each side. Now, while this terminology expresses accurately enough the appearance of the grey matter of the cord as seen in transverse section, it fails entirely to represent its tridimensional aspect, for which purpose the use of the term *column* is obviously the most appropriate. The word is already in common use for one section of the grey matter, viz., the *posterior vesicular column* of Lockhart Clarke (commonly spoken of as *Clarke's column*); Quain, further, as well as other authorities, speaks of various longitudinal tracts of grey matter rich in cells as *ganglionic* or *cell columns;* so that there is no valid objection to the substitution of the more accurate term, *columns*, for the more familar term, *horns*, of the grey matter. Any possible confusion between the white and the grey columns of the respective anterior, lateral, and posterior regions of the cord can be avoided by the invariable addition of the qualifying adjective *white* or *grey* as the case may be. The alternative reform in the nomenclature, the adoption of the author's term *funiculus* in speaking of the white columns, appears to me to be a less desirable one, and less likely to be accepted.

[340] *Veins of the Spinal Cord* (Fig. 1148, p. 754).—According to Quain, two median longitudinal veins, anterior and posterior, are the most important veins of the spinal cord. Von Langer and Toldt (whose nomenclature I have in this instance adopted) write as follows: "The veins of the spinal cord fall into two groups: the *external spinal veins*, *venæ spinales externæ anteriores et posteriores*, which accompany the arteries in front and behind the cord; and the *internal spinal veins*, *venæ spinales internæ*, which run in the substance of the cord beside the central canal; radiating branches connect these two systems of veins, and pass outwards to the *internal vertebral venous plexuses*, *plexus venosi vertebrales interni*" (*op. cit.*, p. 599).

[341] *Commisures of the Cord* (Figs. 1149 and 1150, p. 755).—*The commissure of the cord*, says Gowers, "consists of two parts: an *anterior* or *white* and a *posterior* or *grey commissure*" ("Diseases of the Nervous System," 2nd ed., vol. i., p. 184). A similar account is given by most English anatomists. The *posterior* or *grey commissure*, as its name implies, consists, like the *anterior* or *white commissure*, of connecting fibres, but in the case of the former there is a large amount of neuroglia amongst the fibres, and this gives the commissure a grey aspect. Toldt, as Fig. 1149 shows, divides the commissure of the cord into three parts: a *posterior commissure*, an *anterior grey commissure*, and an *anterior white commissure*. This difference depends merely on the fact that, while English anatomists describe the central canal of the spinal cord as being situated in the centre of the *posterior* or *grey commissure*, Toldt regards the fibres behind that canal as forming the *posterior commissure*, while the portion of the *grey commissure* in front of the canal he calls the *anterior grey commissure;* and in front of this, again, is situate the *anterior white commissure*.

[342] *Collateral Fibres of the Posterior Roots* (Fig. 1150, p. 755).—Recent researches have shown that the fibres of the posterior roots bifurcate as they enter the cord into two principal branches which ascend or descend respectively in the posterior white column or the adjacent part of the posterior grey column (posterior horn—see note [339] above). From these branches, as well as from the root fibre before it bifurcates, numerous *collaterals* (see note [321] above) are given off in four principal directions: (1) to the anterior grey column (anterior horn) of the same side, (2) by the posterior commissure to the grey matter of the opposite side, (3) to the lateral grey column (lateral horn), (4) to the posterior grey column (posterior horn) of the same side, especially to the substantia gelatinosa of Rolando, the solitary cells, and to the posterior vesicular column

of Lockhart Clarke (the last-named are the fibres shown in Fig. 1150). Ultimately these collaterals divide frequently to form a ramification of nerve fibrils intimately associated with the nerve cells of the grey matter. The bifurcation of the posterior root fibre and the offset of the collaterals is shown diagrammatically in Fig. 1140, p. 750.

[343] *Dorsal Nucleus* (Ibid.).—The *posterior vesicular column* of Lockhart Clarke was called by Stilling the *nucleus dorsalis*, and by Macalister the *visceral column*.

[344] *Direct Lateral Cerebellar Tract* (Ibid.).—This tract, called by the author *fasciculus cerebellospinalis*, is somewhat variously named by English authorities. Foster calls it simply the *cerebellar tract;* but this name is inadequate, as other tracts in the cord are connected with the cerebellum. Gowers calls it the *direct cerebellar tract;* Halliburton, the *dorsal or direct cerebellar tract;* Quain, finally, employs the precise but cumbrous name, *dorsolateral ascending cerebellar tract*. I believe, however, that Flechsig's name, *direct lateral cerebellar tract*, is that generally employed, and as it is sufficiently distinctive and at the same time fairly concise, I have adopted this name in the text.

[345] *Septum Posticum of the Subarachnoid Space of the Spinal Cord* (Ibid.).—For an account of this structure, which is called by the author the *septum subarachnoidale*, see Quain, *op. cit.*, vol. iii., part i., p. 188.

[346] *Anterolateral Ascending Tract* (Fig. 1151, p. 756).—The author's name for this is *fasciculus anterolateralis superficialis*, with an alternative German name of *Gowers'scher Strang—i.e., tract of Gowers*. Quain calls it the *ventrolateral* or *anterolateral ascending cerebellar tract*. Halliburton gives both the names used in the text, as alternatives to *ventral cerebellar tract*, to which l tter he gives the first place. Foster calls it the *anterolateral ascending tract*. It is hardly correct to qualify it, as Quain does, as *cerebellar*, for many of the fibres of the tract terminate, not in the cerebellum, but in the corpora quadrigemina. The truly cerebellar portions of this tract may, however, as Foster suggests, be regarded as "simply a more diffuse and outlying part of the [direct lateral] cerebellar tract" (*op. cit.*, p. 895).

[347] *Lateral and Anterior Ground Fibres of Flechsig and Lateral Limiting Layer* (Ibid.).—The *lateral* and the *anterior ground fibres* (*fasciculi lateralis et anterior proprii Flechsigi*) consist of the fibres which are subject to neither ascending nor descending degeneration as a result of experimental or accidental section of the spinal cord; this region, which in section has the form of a crescentic strip of white matter surrounding the front of the posterior horn, the lateral horn, and the anterior horn of the cord, is supposed to be made up of commissural fibres "connecting the segmental mechanisms of the same lateral half of the spinal cord with each other" (Foster). Gowers describes the hindmost portion of the *lateral ground fibres*, that which intervenes between the front of the lateral or crossed pyramidal tract and the grey matter, as the *lateral limiting layer*. This separation, however, like that between the *lateral* and the *anterior ground fibres*, is made purely for descriptive purposes, and has no physiological significance, there being no difference as regards structure or development or (as far as our present knowledge goes) function between the fibres of these areas.

[348] *Tracts of the Posterior White Column* (Ibid.).—This column is chiefly made up of two tracts, the *tract of Goll* and the *tract of Burdach*, which are separated from one another by the posterior intermediate septum (see note [335] above). In the author's nomenclature they are known respectively as the *fasciculus gracilis* and the *fasciculus cuneatus*, the former being continued into the *funiculus gracilis*, and the latter into the *funiculus cuneatus*, of the medulla oblongata. Quain calls them *posteromesial* and *posterolateral columns*, as alternative names to *tract of Goll* and *tract of Burdach*. They are often known in England as *column of Goll* and *column of Burdach*, but the name *tract* is to be preferred, as harmonizing with the nomenclature of the other tracts which have been differentiated in the cord by physiological research.

[349] *Classification of the Nerve Cells of the Spinal Cord* (Fig. 1152, p. 756).—I quote from Von Langer and Toldt's "Anatomy" (7th ed., pp. 588, 589) a passage which explains the names given to the nerve cells in Fig. 1152: "We may distinguish in the spinal cord three varieties of nerve cells [ganglion cells], the differential characteristic being the destination of their nerve processes. (1) The *motor cells* of the anterior grey columns [or anterior horns—see note [339] above,] whose axis-cylinder processes [axons—see note [321] above] are directly continued into motor nerve fibres, and as such constitute the anterior nerve roots. (2) The *tract cells* [*Strangzellen*], whose nerve processes pass into the white matter, in which they run for a space, giving off collaterals [see note [321] above] at intervals; sooner or later they, and their collaterals also, re-enter the grey matter, and there break up into terminal arborizations (*Endbäumchen*)—[the individual fine twigs of the arborizations are called *dendrites;* see note [321] above]. These cells are especially numerous in the region between the anterior and posterior horns. Those tract cells whose processes cross the median plane in the anterior or white commissure of the cord are distinguished as *commissural cells*. (3) The *intercalary cells* [*Binnenzellen, Schaltzellen*], which are much fewer in number than the cells belonging to the other two varieties; their nerve processes do not enter the white substance, but divide within the grey matter into very fine fibrils [dendrites]. They are most numerous in the posterior grey columns [posterior horns]." I have not been able, in the English works at my disposal, to find a classification of the nerve cells of the spinal cord based on the same consideration as that given in the above quotation; hence my rendering of the author's terms *Strangzellen*, and *Binnenzellen* or *Schaltzellen* (for which he gives no Latin equivalents), are neologisms. *Tract cells* is obviously the best rendering of the first, since *Strang* is the German equivalent of the *tract* of the spinal cord of English authors. *Binnenzellen* or *Schaltzellen* I have translated by the words *intercalary cells*, in place of using the more familiar word *intermediate*, in order to avoid confusion with the cells of the *intermediate process* of Gowers (*lateral horn*, or *intermediolateral tract*—see note [3] to p. 754). The term *Binnenzellen* is not used in Fig. 1152, but apparently the term *Golgi'sche Zelle* is used with the same significance (see note [350] below). In conclusion, I may remind the reader that the usual English classification of the nerve cells of the spinal cord is based, not so much on their structural peculiarities or the destination of their processes, as on their arrangement in columns. The *motor cell column*, or the *cell column of the anterior horn*, is, however, made up entirely of the *motor cells* comprising Toldt's first group; further, the other principal cell columns—viz., *Clarke's column* (see note [343] above), the *lateral cell column*, the *middle cell column*, and many of the *cells of the posterior grey column*—consist of Toldt's second group of cells, the *tract cells;* finally, the *intercalary cells* of this author would appear to be identical with those generally known in England as the *solitary cells* of the posterior horn, of which Quain writes (*op. cit.*, vol. iii., part i., p. 17): "Some of the axis-cylinder processes of these cells do not leave the grey matter, but are branched, and their ramifications lose themselves in the interlacement of fibrils which invests other cells.

[350] **Golgi's Cells* (Ibid.).—It was not at first clear to me what cells in particular the author intended to denote by this name. In spite of the fact that so much of our knowledge of the intimate structure of the nervous system is derived from Golgi's work, no structure (except the *corpuscle of Golgi* or *organ of Golgi* found as a sensory nerve terminal in tendons) has hitherto been associated with the name of this investigator, nor is the term *Golgi'sche Zelle* to be found even in Von Langer and Toldt's "Text-book of Anatomy." These authors' classification of multipolar nerve cells serves, however, to throw light on the difficulty. They write (pp. 572, 573): "There are three principal forms of *multipolar* nerve cells [ganglion cells]. In one kind of these—the *first* type of Golgi—we find among the numerous processes one always which remains unbranched or gives off only a few fine collaterals, and this process, on account of its close resemblance to an axis-cylinder, is known as the *axis-cylinder process* [or *axon;* in German *Neurit*]; after a short course it acquires a medullary sheath, and is thus transformed into a medullated nerve fibre. The other processes resemble undifferentiated protoplasm in appearance, and divide again and again until the ultimate fibrils almost cease to be visible from their extreme tenuity; they are known as *protoplasmic processes* [*dendrons* and *dendrites*]; whether they are connected with nerve fibres is a matter not yet determined. . . . In a second kind of multipolar nerve cells [ganglion cells]—the *second* type of Golgi—the cell has, in addition to numerous dendrons, like the first kind, *one* axis-cylinder [axon] only; this last, however, instead of becoming transformed into a long nerve fibre, soon breaks up into an abundant arborization [the German word is *Netz*, literally *network*, but see note [322] above]; cells of this type are met with in the posterior horns of the spinal cord and in the inner or granule layer of the grey matter of the cortex of the cerebellum. Multipolar nerve cells [ganglion cells] of the third kind are distinguished by the fact that they have no dendrons, all their processes being continuous with nerve fibres; cells of this kind are met with in the ganglia of the sympathetic nervous system." If the data given here regarding the cells said to belong to the "second type of Golgi" be compared with those given in note [349] above regarding the *intercalary cells* (*Binnenzellen*), and are further taken in conjunction with the fact that the **Golgi's cell* shown in Fig. 1152 is in the posterior horn, and is unconnected with any of the tract fibres, we are led to conclude that the latter is an alternative name used by the author for the *intercalary cells*, and, finally, that these are the same as the *solitary cells* described in the quotation from Quain at the end of note [349] above.

[351] (Ibid.) The word *central* in these instances denotes merely "having connexions with the cerebrum," and must on no account be confused with "centripetal." In the case of the axis-cylinder process of the cell of Clarke's column, indeed, the fibre is centripetal, for it passes upwards in the direct lateral cerebellar tract, and if severed degenerates upwards. The (red) fibres passing from the anterior and lateral pyramidal tracts to the motor cell column, however, are centrifugal fibres.

[352] *Reflex Collaterals* (Fig. 1155, p. 757).—I quote the following passage from Von Langer and Toldt, *op. cit.*, p. 593: "Concerning the significance of the sensory (*i.e.*, posterior) root fibres of the spinal cord, there still remains much that is obscure; but all the observations hitherto made support the view that the different connexions of the sensory collaterals represent different physiological activities of the sensory root fibres. We may mention as an especially noteworthy fact that those sensory collaterals which pass into the anterior grey columns (anterior horns), and there invest the motor cells with terminal arborizations, would appear to be exceedingly well adapted for the direct transmission of sensory stimuli to a smaller or larger number of motor cells, and that in this manner they form the anatomical basis for the carrying out of reflex movements." These collaterals are those called *reflex collaterals* in Fig. 1155.

[353] **Filum of the Spinal Dura Mater* (Fig. 1157, p. 758).—The *filum terminale*, or *central ligament of the spinal cord*, is a prolongation of the pia mater, enclosing for about half its length an enlarged continuation of the central canal of the cord, with a little grey matter near the upper end. As it perforates the dura mater, opposite the second sacral vertebra, it receives from that membrane a thin fibrous investment, which is called by the author **filum duræ matris spinalis*. The term is not used by Quain or Macalister.

[354] *Metathalamus, Epithalamus, and Hypothalamus* (Fig. 1161, p. 760).—These terms are explained in the following quotation: "In the anterior half of the lateral wall of the *thalamencephalon* [*diencephalon, interbrain, second secondary vesicle*] a hemispherical eminence forms on each side, the *optic thalamus*. In the posterior half of the lateral wall of the *thalamencephalon*, three superimposed regions must be distinguished. The middle of these, lying immediately behind the optic thalamus, the *metathalamus*, develops into the *corpora geniculata;* the region above this, the *epithalamus*, develops into the *pineal body* or *gland* and the *ganglion of the habenula*. The lowest and largest of these three regions unites with a small portion of the *prosencephalon* or *first secondary vesicle* to form the *hypothalamus*. This is definitely marked off from the *thalamus* and the *metathalamus* by the *sulcus hypothalamicus* (*Monroi*), which arches downwards and forwards from the entrance to the aqueduct of Sylvius. The ventral wall of the hypothalamus remains much thinner than the ventral wall of the posterior parts of the brain, and exhibits, in contact with the base of the skull, two acute-angled recesses separated from one another by the optic commissure; the anterior of these is the *optic recess*, and the posterior is the *recess of the infundibulum*. The former is bounded in front by the *lamina cinerea* (*lamina terminalis*, according to Toldt), which, as a constituent of the prosencephalon, is continuous with the wall of the hemispheres. . . . The *hypothalamus* . . . belongs partly to the *prosencephalon*, and partly to the *thalamencephalon*. Thus, the *corpora albicantia seu mamillaria* and part of the *tuber cinereum*, making up the *pars mamillaria hypothalami*, belong to the *thalamencephalon;* whilst the remaining (and greater) portion of the *tuber cinereum*, with the *infundibulum*, and the *posterior lobe* of the *pituitary body* or *hypophysis cerebri*, as well as the *optic commissure* and the *lamina cinerea*, making up the *pars optica hypothalami*, belong to the *prosencephalon*" (Von Langer and Toldt's "Anatomy," 7th ed., pp. 623, 624).

[355] **Rhombencephalon* (Fig. 1163, p. 761).—This term is used by the author to denote the *medulla oblongata*, the *pons Varolii*, the *cerebellum*, and the **isthmus rhombencephali* (see note [369] below), the solid parts, that is to say, which environ the *fourth ventricle*, the floor of which is known in Germany as *fossa rhomboidea*. (In England *fossa rhomboidalis* is an alternative name, seldom employed, for the fourth ventricle as a whole—see note [336] above.)

[356] *Flexures of the Developing Brain* (Fig. 1164, p. 762).—These flexures, denoted by Quain simply as *first*, *second*, and *third cerebral flexures*, respectively, have no Latin names in the author's nomenclature. The German names are: for the *first flexure*, beneath the mid-brain, *Scheitelkrümmung—i.e., parietal flexure;* for the *second flexure*, in the region of the pons, with the convexity directed forwards (the reverse of the first), *Brückenkrümmung—i.e., pontine flexure;* for the third, at the junction of the medulla

oblongata with the cord, likewise with a ventralwards convexity, *Nackenkrümmung—i.e., cervical flexure.*

[357] (Ibid.) The *fourth* and *fifth secondary vesicles* (*epencephalon* and *metencephalon*, according to Quain) are developed from the *posterior primary vesicle* or *hind-brain*. Note that *metencephalon* is used by Toldt in a different sense, signifying not the *fifth*, but the *fourth secondary vesicle*.

[358] *Mid-brain* (Ibid.).—Whereas the *anterior* and *posterior primary vesicles* give rise to two *secondary vesicles* each (*first* and *second*, *fourth* and *fifth*, respectively), the *middle primary vesicle* remains undivided as the *third secondary vesicle*. From this, the *mid-brain* or *mesencephalon*, are developed the aqueduct of Sylvius, the corpora quadrigemina, and the crura cerebri.

[359] *Pineal Stria or Stria Medullaris* (Fig. 1169, p. 763).—This white stria runs along the upper curved margin of the lateral wall of the third ventricle, from the habenula of the pineal body behind to the anterior pillar of the fornix in front, and separates the inner from the upper surface of the optic thalamus. Owing to its connexion with the fornix, the *pineal stria* is known also as the *tænia fornicis*, and this latter name, indeed, is that chiefly used by Quain to denote this structure. The name *tænia fornicis* is, however, used by Toldt in a different sense—viz., to signify the line of attachment of the inner layer of the choroid plexus of the lateral ventricle to the outer free margin of the fornix. See Fig. 1203, p. 784, and Fig. 1204, p. 785, also note [392] below.

[360] **Hypothalamus and* **Sulcus Hypothalamicus* (*Monroi*) (Fig. 1173, p. 764).—The free internal surface of the optic thalamus, which forms the upper part of the lateral wall of the third ventricle, is bounded below by a sulcus which runs forwards from the anterior extremity of the aqueduct of Sylvius to the foramen of Monro. This is known as the *sulcus of Monro* (*sulcus hypothalamicus Monroi*), which is described neither by Quain nor by Macalister, though the latter authority depicts it in Fig. 778, p. 709, of his "Text-book of Human Anatomy." Von Langer and Toldt call this sulcus alternatively *sulcus limitans ventriculi tertii*—see note [377] below. The parts below the sulcus, forming the floor of the third ventricle, make up together what the author calls the **hypothalamus*. The use of this term in relation to the development of the brain has been already explained in note [354] above. The parts of the adult brain which, according to the Continental terminology, combine to form the hypothalamus are: (1) The *corpora albicantia seu mamillaria*, (2) the *tuber cinereum*, (3) the *pituitary body* or *hypophysis cerebri*, (4) the *optic commissure* or *chiasma* and the *optic tracts*, (5) the *lamina cinerea*. All these structures are shown in Fig. 1173, p. 764, except the *tuber cinereum*, which is depicted in Fig. 1174, p. 765.

[361] *Infundibulum et* **Recessus Infundibuli* (Ibid.).—The author draws a distinction between the *infundibulum*, the funnel-shaped downwardly projecting process at the base of the brain, behind the optic commissure, to the extremity of which the pituitary body is attached, and the **recess of the infundibulum*, the cavity in the interior of that process, which is part of the third ventricle. Quain and Macalister use the term *infundibulum* indifferently to denote either the process or its cavity.

[362] *Posterior Perforated Space and* **Anterior and* **Posterior Recess* (Ibid.).—The *posterior perforated space* (*locus perforatus posticus*) lies in a deep fossa (*fossa interpeduncularis Tarini*, the *interpeduncular fossa of Tarini*) between the diverging crura cerebri. Yet another name for the triangular space enclosed between the crura at the base of the brain is that used by Schwalbe—*trigonum interpedunculare*. The posterior angle of this triangular fossa is situate in the median line at the anterior margin of the pons Varolii; this angle is called by Toldt **recessus posterior*. The anterior extremity of the interpeduncular fossa or posterior perforated space, the **recessus anterior* of Toldt, lies immediately behind the *corpora albicantia seu mamillaria*. The terms **anterior* and **posterior recess* are used neither by Quain nor by Macalister. The grey matter forming the floor of the space is called by Toldt *substantia perforata posterior*, and by Macalister the *posterior perforated plate*. The anterior part of this plate forms the posterior part of the floor of the third ventricle; but behind a line joining the anterior borders of the third nerves it forms the floor of the aqueduct of Sylvius.

[363] *Pyramids* (Ibid.).—The *pyramids* of the medulla oblongata are sometimes distinguished as the *anterior pyramids*, the *funiculi graciles* with their *clavæ* being by some anatomists called the *posterior pyramids*.

[364] *Anterior Extremity of the Aqueduct of Sylvius* (Ibid.).—Immediately in front of the posterior commissure, the aqueduct of Sylvius expands abruptly to form the third ventricle. To this expansion the author gives the name of *aditus ad aquæductum cerebri*.

[365] *The Pineal Body and its Connexions* (Ibid.).—As the accounts of the connexions of the *pineal body* or *gland* (*conarium*, *epiphysis cerebri*) given by Von Langer and Toldt, Quain, and Macalister, respectively, differ considerably, and this not merely in terminology, it is necessary, in order that the denotation of the terms used in Fig. 1173, p. 764, and in some later figures, may be clearly understood, to quote from the works of these authors. According to Von Langer and Toldt (*op. cit.*, p. 630), "The *pineal body* (*corpus pineale*) . . . is developed from the *epithalamus* [see Fig. 1161, p. 760, and note [354] above] . . . it projects freely from the roof of the mid-brain, between the upper or anterior pair of corpora quadrigemina, and is connected with these by a thin layer of white substance, which extends forwards from the base of the pineal body, and then curves downwards to become directly continuous with the quadrigeminal lamina; this layer of white substance forms the *posterior commissure* of the third ventricle. Above this there extends forward from the base of the pineal body an extremely thin layer of grey substance, the *commissura habenularum*, which extends on either side into a thin stria, the *peduncle of the pineal body* or *habenula;* and the habenula is further attached on both sides to the back of the optic thalamus by the intermediation of a triangular expansion, the *trigonum habenulæ*, and of this last the *pineal stria* (*stria medullaris thalami*) [see note [359] above] is a direct forward continuation. Between the upper grey and the lower white medullary layer proceeding forwards from the base of the pineal body is a narrow pointed backward extension of the third ventricle, the *pineal recess* (*recessus pinealis*). . . . The *velum interpositum* or *tela choroidea superior* forms the upper boundary, and the anterior half of the upper surface of the pineal body forms the lower boundary, of another pointed backward extension of the third ventricle, the *suprapineal recess* (*recessus suprapinealis*)." According to Quain (*op. cit.*, vol. iii., part i., p. 114), "the *pineal body* . . . is attached on each side by a broad but flattened stalk of white fibres (*pedunculus conarii*) which is separated by the pineal recess of the ventricle into a dorsal and a ventral portion. The ventral portion curves downwards; it belongs to the ventral portion of the posterior commissure. . . . The upper portion extends on each side along the ridge-like junction of the upper and mesial surfaces of the thalamus as the pineal stria or tænia fornicis [see note [359] above]. At the sides the stalk merges into the trigonum habenulæ." The term *habenula* is not employed by Quain in this passage, but elsewhere (p. 111) he mentions it as

an alternative name for the *peduncle of the pineal body*. Though this author describes the peduncle as consisting of white fibres, the middle of what he calls the *dorsal portion* of the habenula is identical with the *thin grey layer* constituting the *commissura habenularum* of Von Langer and Toldt. According to Macalister (*op. cit.*, p. 720), "On the inner side of each optic thalamus is a white streak, the *crus pinealis*, outside which is a grey band, the *habenula of the pineal body*, passing from the *ganglion habenulæ* or *trigonum habenulæ;* beginning below and in front, and coursing backwards along its upper and inner angle, to end by joining with a white band, the *transverse frænulum of the pineal body*. The junction between the habenula and frænulum is dilated into a small triangular knob, the *trigonum habenulæ*. Below and attached to this is a transverse white band, the *posterior commissure*, in reality a foremost portion of the mid-brain." Thus, Macalister extends the significance of the term *crus pinealis* to include the *pineal stria* (*stria medullaris thalami*—see note [359] above). The *commissura habenularum* of Toldt is the *transverse frænulum of the pineal body* of Macalister, which the latter anatomist, in agreement with Quain, describes as a *white band*. Macalister is peculiar in identifying the *ganglion habenulæ* and the *trigonum habenulæ*, the former term having been applied by Meynert to a collection of nerve cells in the interior of the latter. With regard to the biological significance of the structures above described, Macalister remarks (*op. cit., loc. cit.*): "These habenal bands are possibly the remains of the optic nerve of the rudimentary median eye coming from the front of the optic thalamus and passing backwards to the pineal body." On p. 722 he writes: "The base of the pineal body is attached by a short stalk to a transverse white band or frænulum above the posterior commissure. . . . The pineal body is a rudiment of a median parietal eye, which probably at one time in ontogeny reached the surface. It is proportionally much larger in the fœtus than in the adult."

[366] **Fastigium* (Ibid.).—This name is given by the author to the angular recess in the roof of the fourth ventricle, between the valve of Vieussens (superior medullary velum) and the inferior medullary velum. The apex of the recess is directed towards the medullary centre of the worm, and in that centre, adjacent to the fastigium on either side of the middle line, is a small collection of grey matter known as the *nucleus of the roof* or *nucleus fastigii*, one of the nuclei of the white matter of the cerebellum (see Fig. 1187, p. 772, and Fig. 1188, p. 773). Although the term *nucleus fastigii* is used both by Quain and Macalister, neither of these authorities employs the term *fastigium*. Quain speaks of it as the *tent of the fourth ventricle*.

[367] *Gyrus Rectus* (Fig. 1174, p. 765).—This name, or its English equivalent *straight gyrus*, is sometimes given to the inner part of the *inner orbital gyrus*, between the olfactory sulcus and the mesial border of the orbital surface of the frontal lobe.

[368] *Middle or Grey Root of the Olfactory Tract* (Ibid.).—According to Quain (*op. cit.*, vol. iii., part i., p. 159), "the *olfactory tract* . . . bifurcates posteriorly into two roots, *mesial* and *lateral*, which diverge as they pass backwards and enclose . . . a space, the *trigonum olfactorium*, which is also known as the *middle* or *grey* root of the tract." The term *stria olfactoria intermedia*, used by Toldt to denote the *middle* or *grey root of the olfactory tract*, is, however, distinguished by him from the *trigonum olfactorium* (see Fig. 1174, p. 765). "It is very short and often very ill-defined; and it passes directly backwards to the anterior perforated lamina" (Von Langer and Toldt, *op. cit.*, p. 639). The middle root, in fact, occupies the central portion of the trigonum olfactorium.

[369] *Isthmus Rhombencephali, etc.* (Fig. 1175, p. 766).—I quote from Von Langer and Toldt's "Anatomy" (pp. 618, 619) the following passage, in order to throw light on certain differences between the author's nomenclature and that usual in England. (The significance of the term *rhombencephalon* has already been explained in note [355] above.) "The *isthmus rhombencephali* constitutes the uppermost, most constricted portion of the rhombencephalon, serving to connect it with the mid-brain and the cerebrum." The *dorsal surface* of this isthmus, consisting of the *brachia conjunctiva* (*superior peduncles of the cerebellum, crura cerebelli ad cerebrum*), with the *velum medullare anterius* (*superior medullary velum*, or valve of *Vieussens*) between them, and the *frænulum veli* which passes forwards from the velum to the *sulcus longitudinalis seu sagittalis* of the quadrigeminal lamina, are then described, and the authors proceed: "On the *lateral surface* of the isthmus we observe a circumscribed triangular area, which exhibits a fasciculus of fibres passing on each side from the interior of the cerebral peduncle, then bending upwards on the outer surface of the superior peduncle of the cerebellum to reach the quadrigeminal lamina. This is the *trigonum lemnisci*. The triangle is separated below from the crus cerebri by a well-marked furrow, the *sulcus lateralis mesencephali;* it is bounded in front by the lower (or posterior) brachium of the quadrigeminal bodies; behind it is separated from the outer margin of the superior peduncle of the cerebellum by a shallow groove passing obliquely backwards and downwards towards the pons Varolii. The fasciculus of fibres which comes to the surface in the triangle just described is known as the *fillet* or *lemniscus*. The *basal surface* of the *isthmus rhombencephali* consists of the parts forming the floor of the upper end of the fourth ventricle." The above fully explains the author's use of the term *isthmus rhombencephali* (Fig. 1161, p. 760, and Fig. 1162, p. 761); embryologically this corresponds to the *isthmus of His*, the constriction between the third and fourth cerebral vesicles (Quain, *op. cit.*, vol. i., part i., p. 67). The term *isthmus encephali* is used by Quain in a different sense to denote the mid-brain itself (*op. cit.*, vol. iii., part i., p. 38). As regards the *trigonum lemnisci* (**triangle of the fillet*), this term is not used by Quain or Macalister, though the area in question is minutely described by the former authority The fillet, he writes (*op. cit.*, vol. iii., part i., p. 103), "is seen on the surface as a band of obliquely curved fibres, occupying a triangular area at the side of the tegmentum, and it was to this band that the name of *fillet* was originally applied by Reil. It is now known as the *lower* or *lateral fillet*." The *sulcus lateralis mesencephali* is known in England either by that name or by its English equivalent of *lateral groove;* it indicates the outer limit of the crusta of the cerebral peduncle and the line along which the substantia nigra comes to the surface on the outer side, just as the *oculomotor groove* indicates the inner limit of the crusta (marking it off from the posterior perforated space) and the line along which the substantia nigra comes to the surface on the inner side.

[370] **Tænia Chorioidea* (Fig. 1176, p. 767).—This name is given by the author to the line of attachment of the *outer layer* of the choroid plexus of the lateral ventricle, here running parallel with and adjacent to the *stria terminalis* or *tænia semicircularis*. See note [1] to p. 784, and note [392] below.—It will be noted that in the official German nomenclature the term *chorioidea* retain a syllable that has been lost in the English equivalent *choroid*. The former spelling is etymologically more correct, the words being derived from the Greek χόριον, a membrane.

[371] (Ibid.) *Middle* of the *upper* or *dorsal* portion of the *pedun-*

culus conarii or *habenula* (Quain), or *transverse frænulum of the pineal body* (Macalister). See note [365] above.

[372] (Ibid.) The superior or anterior pair of corpora quadrigemina or optic lobes were termed *nates* by Vesalius, the inferior or posterior pair being called *testes*, but these names are now rarely used.

[373] (Ibid.) These apertures in the epithelial roof of the lateral recess of the fourth ventricle are described by Quain, who does not, however, give them any distinctive name; Macalister calls them the *foramina of Key and Retzius* or *foramina of Mierzejewsky*.

[374] (Fig. 1177, p. 767.) "The epithelial layer of the roof of the ventricle follows all the convolutions of the choroid plexuses, but is nowhere pierced by them; it is generally described as the *epithelium of the plexuses*" (Quain, *op. cit.*, vol. iii., part i., p. 50).

[375] *Stratum Nucleare* (Ibid.).—This term is not used by Quain or Macalister, nor even is it to be found in Von Langer and Toldt's "Anatomy." Apparently it denotes the tract of grey matter in which the nuclei of the lower cranial nerves are situated, this tract being in the situation indicated in Fig. 1177.

[376] *Funiculus Teres and *Facial Eminence* (*Eminentia Teres*) (Figs. 1178, 1179, p. 768).—On either side of the median groove in the floor of the fourth ventricle is an eminence, called by Toldt *eminentia medialis*, extending from one extremity of the ventricle to the other. In England it is variously known as the *funiculus teres*, *fasciculus teres*, and *eminentia teres*. "In the upper half of the floor of the ventricle there may be seen, on the inner side of the superior fovea, a rounded elevation of the fasciculus teres, produced by the nucleus of the sixth nerve, with the deep part of the facial arching round it" (Ellis, "Demonstrations of Anatomy," 10th ed., p. 234). "Just above the auditory striæ, the eminentia medialis widens out to form a flattened tubercle, characterized also by a somewhat lighter colour than the surrounding portion of the floor of the ventricle; owing to its relation to the root bundles of the facial nerve, this tubercle is called the **facial eminence* (**colliculus facialis*)" (Von Langer and Toldt, *op. cit.*, p. 620). Thus, while Ellis gives no name at all to the eminence under consideration, Von Langer and Toldt give one that can hardly be considered appropriate; for, though it is true that the inner genu of the facial nerve gives rise to its projection, it is not the *facial* but the *abducent nucleus* that lies beneath it, and the name of **facial eminence* is not in harmony with the names *auditory tubercle*, *trigonum hypoglossi*, etc., given to other parts of the floor of the fourth ventricle. I would suggest, therefore, that the name of *eminentia teres* should no longer be used as a synonym for the *funiculus* or *fasciculus teres*, but should be reserved to denote that part only of the latter beneath which lies the nucleus of the sixth nerve and the inner genu of the facial nerve. Thus, *eminentia teres* would be the English equivalent of the *colliculus facialis* of the Continental nomenclature. In the last edition of Quain's "Anatomy" the term is used with this significance: "Between the superior fovea and the median sulcus is the prolongation of the funiculus teres, which is prominent (*eminentia teres*) opposite the fovea, but becomes gradually less so above and below" (*op. cit.*, vol. iii., part i., pp. 50, 51).

[377] **Limiting Sulci* (Fig. 1179, p. 768).—Concerning the limiting sulci in general, Von Langer and Toldt write as follows (*op. cit.*, pp. 602, 603): "In addition to the longitudinal segmentation of the brain by means of transverse furrows . . . we recognise in the embryonic brain also a *ventral* and *dorsal* segmentation. The boundaries between the ventral and dorsal segments consist of right and left lateral longitudinal furrows, the *sulci limitantes*, which extend through all the six principal subdivisions of the brain, and are still clearly recognisable in the adult brain. The significance of this ventrodorsal segmentation lies in the fact that from the respective ventral and dorsal portions of the individual secondary cerebral vesicles quite distinct portions of the brain are developed; and in particular it is to be noticed that in the ventral segments the nuclei of origin of all the motor cranial nerves arise—in the dorsal segments, on the other hand, the nuclei of origin of all the sensory cranial nerves. In this fact we find an important homology between the brain and the spinal cord." As regards the **limiting sulci of the floor of the fourth ventricle* in particular (see Fig. 1179, p. 758, and Fig. 1210, p. 787), the same authors write (*op. cit.*, p. 621): "We must also mention the *sulci limitantes fossæ rhomboideæ;* these are two longitudinally disposed **limiting sulci* which separate the parts developed from the ventral portion of the embryonic *rhombencephalon (see note [369] above) from the parts developed from the dorsal portion of the same. Passing upwards from the calamus scriptorius, the limiting groove lies on either side between the trigonum hypoglossi and the ala cinerea; above this the *limiting sulcus is represented by the inferior fovea, and it proceeds thence upwards along the inner border of the trigonum acustici or auditory triangle, its course being somewhat curved, with the concavity towards the median line, to pass into the superior fovea; thence upwards it extends along the outer border of the eminentia teres as far as the aqueduct of Sylvius." The *sulcus of Monro*, *sulcus hypothalamicus Monroi* (see Fig. 1173, p. 764, and note [360] above), is another sulcus of this group, being given by Von Langer and Toldt the alternative name of *sulcus limitans ventriculi tertii*.

[378] **Nucleus of the Optic Nerve* (Fig. 1180, p. 769).—This term is not used by Quain or Macalister. The author here applies it to the *grey matter of the external geniculate body*, and Von Langer and Toldt write (*op. cit.*, p. 648): "The light-perceiving fibres of the optic nerve for the most part pass into the external geniculate body, and in part also into the upper quadrigeminal body. The grey nuclei of these bodies are therefore to be regarded as the *nuclei* of the optic nerve." The appropriateness of the term must, however, be questioned, in the light of the most recent observations. Gowers writes on this point ("Diseases of the Nervous System," 2nd ed., vol. ii., p. 54): "Of these intermediate stations [between the fibres of the optic tract and the grey matter of the hemisphere], the external corpus geniculatum has been commonly regarded as that which is of chief importance in connexion with the visual fibres, since its atrophy has been frequently observed in cases of long-standing atrophy of the tract. But many recent observations establish the fact that disease limited to the posterior extremity of the optic thalamus may cause hemianopia, and it seems doubtful whether the symptom is caused by disease of the external geniculate body. Hence we must regard the pulvinar as the intermediate visual centre, and the precise function of the corpus geniculatum becomes again mysterious."

[379] *The motor nucleus of the glossopharyngeal and pneumogastric nerves* (Fig. 1181) is otherwise known as the *nucleus ambiguus*, or *accessory* or *efferent vagoglossopharyngeal nucleus* (Fig. 1180). From this nucleus arise the fibres that make up what the author calls the *motor root* of the pneumogastric nerve, the *sensory root* arising from the *principal* nucleus of the same nerves or *nucleus of the ala cinerea;* finally, the *funiculus solitarius* supplies a *spinal root* to the pneumogastric nerve.

[380] *Nomenclature of the Parts of the Cerebellum* (Figs. 1182, 1183, p. 770).—Quain's description of the cerebellum is so much fuller and more minute than that of Von Langer and Toldt, that it has

been impossible, in Figs. 1182 to 1189, to incorporate the whole of Quain's terminology (as I have endeavoured to do throughout this English edition of Toldt's Atlas); and in the text of these figures I have for the most part been content to give the established English renderings of the Latin names used in the original. As heretofore, however, Quain's terminology has remained the standard, though a portion only of that author's description is represented in these figures. The three principal omissions in Von Langer and Toldt's description of the cerebellum are: (*a*) that the fissures and sulci, with the exception of the *great horizontal fissure* and the **transverse fissure* (see note [383] below) are left unnamed; (*b*) that while the worm and the hemispheres respectively are divided into segments in the usual manner, the names used by Quain for the *lobes*, each consisting of a segment of the worm together with the parts of the hemispheres specially related to that segment, are not given by the German author; and (*c*) that the *slender lobe* (*lobus gracilis*) of the under surface of the hemispheres is entirely omitted from Toldt's description. As far as can be judged from Figs. 1183 and 1185, the *anterior part* of the *slender lobe* (*lobus gracilis anterior*) constitutes the hinder portion of the *lobus biventralis* of the author; while the *posterior part* of the *slender lobe* (*lobus gracilis posterior*) constitutes the anterior portion of the *lobus semilunaris inferior* of the author.

[381] *Quadrilateral Lobe* (Fig. 1882, p. 770).—According to Quain (*op. cit.*, vol. iii., part i., p. 74), "The combined anterior and posterior crescentic lobes of each hemisphere were formerly termed the *quadrilateral lobe*." In Ellis's "Demonstrations of Anatomy" this lobe is called the *anterior* or *quadrate lobe*. Macalister terms its subdivisions the *anterior* and *posterior lunated lobules*. Kölliker called them *lobus lunatus anterior et posterior*.

[382] *Central Lobe and Central Lobule* (Ibid.).—It would be better to use the name *central lobule* to denote the part of the worm situate between the lingula and the culmen, and to reserve the name *central lobe* for the *lobule* and its two *alæ* considered as a whole. See also note [380] above.

[383] *Transverse Fissure of the Cerebellum* (Fig. 1184, p. 771).—"The grey cortex of the cerebellum, considered as a whole, has the form of a shell, open in front, and receiving into its interior, by means of this anterior, transversely-disposed opening (**fissura transversa cerebelli*), the three pairs of cerebellar peduncles" (Von Langer and Toldt, *op. cit.*, p. 615). This so-called *transverse fissure* is, however, simply the anterior part of the *great horizontal fissure*, which, to quote Macalister (*op. cit.*, p. 727), "widens towards the pons, where it receives the crus [crura] cerebelli."

[384] **Capsule of the Dentate Nucleus* (Fig. 1187, p. 772).—According to Quain (*op. cit.*, vol. iii., part i., p. 83), "The dentate nucleus may be described as consisting of a plicated pouch or capsule of grey substance, open at one part and enclosing white matter in its interior, like the dentate nucleus of the lower olivary body." Toldt, however, uses the word *capsule*, not to denote the corrugated grey lamella of the dentate nucleus, but in the sense explained in the following quotation (Von Langer and Toldt) *op. cit.*, p. 613): "The white medullary substance which immediately envelops the *nucleus dentatus* consists of thick medullated nerve fibres, which on all sides enter the grey lamella of the nucleus." These white fibres thus form a *capsule* for the dentate nucleus in the same sense in which the white matter adjacent to the lenticular nucleus of the corpus striatum forms the internal and the external capsule. *Cf.* also the fibres called by Stilling the *semicircular fibres*, which curve round the corpus dentatum in their passage from the inferior peduncle to the cortex of the cerebellar hemisphere. They are shown in a drawing after Stilling in Quain's "Anatomy," vol. iii., part i., p. 83, Fig. 60.

[385] *Nucleus of the Olivary Body* (Figs. 1188, 1189, p. 773).—Toldt calls this *nucleus olivaris inferior*, and in England also it is sometimes distinguished as the *inferior olivary nucleus*. Most frequently, however, it is spoken of as the *olivary nucleus* without qualification, the *accessory olivary nuclei* (Fig. 1239, p. 786) and the *superior olivary nucleus* (Fig. 1211, p. 787) being always carefully distinguished by the use of the qualifying adjective. The nucleus of the lower olive is also known as the *corpus dentatum of the olive*.

[386] *Sulci and Gyri of the Outer or Convex Surface of the Occipital Lobe* (Fig. 1192, p. 776).—These are more variable than those of the other lobes, and the matter is further complicated by divergencies in nomenclature, and by a want of agreement as to the anterior boundary of the occipital lobe on the outer or convex surface of the hemisphere. According to Von Langer and Toldt, "this boundary is constituted by a very variable vertically disposed furrow, the *sulcus occipitalis anterior*." This sulcus is not described by Quain, but, as far as can be judged from Fig. 1192 of Toldt's Atlas, it must be regarded as an aberrant, detached, and unusually profound portion of the *anterior occipital sulcus* of Quain, which Toldt (following Ecker) calls the *transverse occipital sulcus*. As regards the *gyri* of the occipital lobe, the old description of three *occipital gyri—superior*, *middle*, and *inferior*—has for the most part been abandoned. Toldt describes *superior occipital gyri*, above the *transverse occipital sulcus*, continuous with the *cuneus* of the mesial surface; and *lateral occipital gyri*, below that sulcus, "uniting posteriorly to form the *occipital pole* of the hemisphere" (see Fig. 1194, p. 777). Quain divides the outer surface of the occipital lobe into an *anterior occipital gyrus*, "between the anterior occipital sulcus (transverse occipital sulcus of Toldt) and the upturned end of the lateral occipital sulcus," and a *posterior occipital gyrus* "behind the upturned end of the lateral occipital sulcus." Owing to these manifold discrepancies, I have in the text been content to give a literal English translation of the Latin names used by Toldt to denote the sulci and gyri of the outer surface of the occipital lobe.

[387] **Rostral Lamina* (Fig. 1193, p. 776).—"The *lamina rostralis* is a lamella of the thickness of a sheet of notepaper, directly continuous with the rostrum of the corpus callosum, which curves downwards, concave anteriorly, to the anterior commissure, envelops that structure, and below it is continued as the *lamina cinerea*; on either side the rostral lamina is directly continuous with the subcallosal gyri or peduncles of the corpus callosum, thus appearing to constitute a commissural layer between the latter" (Von Langer and Toldt, *op. cit.*, p. 641). "The *rostrum* of the corpus callosum becomes gradually narrower as it descends, and is connected with the lamina cinerea by a thin white layer, the *commissura baseos alba* of Henle" (Quain, *op. cit.*, vol. iii., part i., p. 128).

[388] *First or Superior Frontal Gyrus, Marginal Gyrus, and Paracentral or Oval Lobule* (Figs. 1194, 1195, p. 777).—The *first or superior frontal gyrus* consists of two portions—an *outer*, smaller, on the outer or convex surface, and an *inner*, larger, on the inner or mesial surface of the frontal lobe; these are continuous over the upper mesial border of the hemisphere. The *outer* part is bounded above by the border just named, and below by the superior frontal sulcus; to this part alone the name of *first frontal convolution* is in England often restricted. The *inner* part, commonly known in England as the *marginal gyrus*, is bounded above by the upper mesial border of the hemisphere, and below and behind by the callosomarginal fissure. The marginal gyrus, again, is divided into two portions by the *anterior ascending ramus of the paracentral fissure*. The anterior and much larger portion

is that denoted by the author in Fig. 1195 as the *gyrus frontalis superior*. The posterior extremity of the marginal gyrus, separated from the rest by the above-mentioned sulcus, is known as the *paracentral* or *oval lobule*. This lobule is continuous with the two central gyri on either side of the upper extremity of the fissure of Rolando.

[389] **Triangular Recess* (*of the Third Ventricle*) (Fig. 1200, p. 782).—This name is not used by Quain or Macalister. Von Langer and Toldt describe the recess in the following terms (*op. cit.*, pp. 632, 633): "Above the lamina cinerea, the anterior pillars of the fornix (columnæ fornicis) constitute the anterior wall of the third ventricle. Since these pillars converge as they ascend, there exists between them a triangular fossa, the **recessus triangularis*, which is closed in front by the attachment of the septum lucidum to the front of the anterior pillars of the fornix. At the base of the **triangular recess* we see the middle of the anterior commissure." (The **triangular recess* is well shown in Fig. 1220, p. 792, and in Fig. 1224, p. 795.)

[390] *Gyrus Fornicatus and Sulcus Cinguli* (Fig. 1201, p. 783).—The terms *gyrus fornicatus*, *gyrus cinguli*, and *callosal gyrus* are used by Quain as synonymous, to denote the convolution marked *gyrus cinguli* in Fig. 1201, p. 783. Toldt, however, employs the term *gyrus fornicatus* in a more extended sense, as a general name for the *gyrus cinguli* and *gyrus hippocampi* considered as a whole (the *grand lobe limbique* of Broca). The *gyrus cinguli* is bounded above by the *sulcus cinguli*, the *callosomarginal fissure* of English authors (see Fig. 1195, p. 777); and this is divided by Toldt into a *pars marginalis* and a *pars subfrontalis*, *marginal* and *subfrontal portions*, the terms being self-explanatory. The posterior portion of this sulcus was called by Wilder the *paracentral fissure*; the anterior portion, which is parallel with the genu of the corpus callosum, the *prelimbic fissure*.

[391] **Free Portion and *Covered Portion of the Anterior Pillar of the Fornix* (Ibid.).—"The anterior pillars of the fornix, or columnæ fornicis, are rooted below in the corpora albicantia seu mamillaria, from which they pass obliquely upwards, forwards, and inwards through the grey matter of the *hypothalamus [see note [354] above], emerging therefrom in front of the anterior extremity of the optic thalamus. We thus distinguish two portions in each anterior pillar of the fornix, viz.: an inferior portion, the **pars tecta columnæ fornicis*, which is hidden in the substance of the lateral wall of the third ventricle; and a superior portion, the **pars libera columnæ fornicis*, which ascends free in front of the optic thalamus" (Von Langer and Toldt, *op. cit.*, pp. 642, 643). Between the free portions of the two pillars is situate the **triangular recess* (see note [389] above); and they form the anterior boundary of the foramen of Monro, which is situate between the columnæ fornicis and the anterior extremities of the optic thalami.

[392] *The Use of the Term "Tænia"* (Figs. 1202, 1203, p. 784).—Von Langer and Toldt use the term *tænia* in a more precise and restricted sense than that in which it is used by Quain, and it seems expedient to give a brief account of the significance attached to this term by these respective authorities in all cases in which they use it in describing the anatomy of the brain. One instance, in which Quain and Toldt use the term in exactly the same sense, may be first dismissed; this is to denote the *tænia ventriculi quarti*, the *tænia* (*of the fourth ventricle*), often, however, called the *lingula* by English anatomists—see Fig. 1177, p. 767, Fig. 1178, p. 768, and Fig. 1188, p. 773 (Macalister denotes the lower part of the tænia or lingula by the name *ponticulus*, a name applied by Quain to a quite different structure, viz., a band of arched fibres often seen crossing the upper end of the pyramid of the medulla oblongata). The other *tæniæ* described by Toldt—*tænia chorioidea*, *tænia fimbriæ*, *tænia fornicis*, and *tænia thalami*, all classed together as *tænia telarum*—are the lines of attachment of the velum interpositum and its associated choroid plexuses, along which lines the *lamina chorioidea epithelialis*, *i.e.*, the epithelial coat of these structures, becomes continuous with the epithelial covering of the ependyma of the ventricles. Thus, the *tænia thalami* is the line of attachment on either side of the lower surface of the velum interpositum, this line extending forwards from the pineal body and its peduncle along the *stria medullaris thalami* (*pineal stria* of English authors, also known in England as the *tænia fornicis*—see below, and note [359] above) to the foramen of Monro, where the *tænia thalami* passes into the *tænia chorioidea*. From the foramen of Monro, the *inner layer* of the attachment of the choroid plexus of the lateral ventricle passes (1) along the outer free margin of the fornix, where it forms the *tænia fornicis*, and is continued (2) as the *tænia fimbriæ* along the outer margin of the *fimbria hippocampi* (see below) to the end of the inferior or descending horn of the lateral ventricle, where this layer also becomes continuous with the *tænia chorioidea*. This last, the *outer layer* of the attachment of the choroid plexus of the lateral ventricle, "runs along the border of a thin layer which proceeds from the tail of the caudate nucleus as a portion of the wall of the vesicle of the cerebral hemisphere in which no medulla has formed, and is attached to the optic thalamus along the upper surface of the *vena terminalis* (*vein of the corpus striatum*), hence called the *lamina affixa* [see below]. At the foramen of Monro, as already remarked, the *tænia chorioidea* is continuous with the *tænia thalami*" (*op. cit.*, p. 644). It will be seen that Toldt's use of the term *tænia* has the great merit of consistency.—As regards the *tæniæ* of English authors: (1) the *tænia fornicis*, as already explained, is a synonym for the *pineal stria*, called by Toldt *stria medullaris thalami*, and is the line of attachment of the choroid plexus of the third ventricle (called by Toldt *tænia thalami*); (2) the *tænia hippocampi* or *fimbria* (*fimbria hippocampi* of Toldt) is the downward prolongation, in the inferior or descending horn of the lateral ventricle, of the posterior pillar of the fornix, and is itself prolonged anteriorly into the white matter of the uncus (this structure is called by Macalister the *corpus fimbriatum*; its inner margin appears on the surface of the limbic lobe, above the dentate convolution or fascia dentata Tarini, from which it is separated by the fimbriodentate sulcus—see Fig. 1201, p. 783): to the ventricular margin of the fimbria the choroid plexus of the lateral ventricle is attached by means of (3) the *tænia fimbriæ*, a term used by Quain (*op. cit.*, vol. iii., part i., p. 158) in the same sense as that in which it is used by Toldt; (4) the *tænia semicircularis*, called by Toldt *stria terminalis*, a name very commonly used also by English anatomists, is the white stria separating the dorsal surface of the optic thalamus from the caudate nucleus of the corpus striatum: it is adjacent to the line of attachment of part of the *tænia chorioidea* of Toldt, and along it runs the *vein of the corpus striatum* (*vena terminalis* of Toldt): "Close to the ependyma and lying over this vein of the corpus striatum is a small greyish band, containing longitudinally running nerve fibres: this has been called the *lamina cornea*" (Quain, *op. cit.*, vol. iii., part i., p. 122)—the *lamina cornea* of Quain is the *lamina affixa* of Toldt; (5) the *tænia pontis* (*fila lateralia pontis* of Toldt) is figured on p. 766, and described in note [2] on that page; (6) finally, the name of *tæniæ tectæ* (*striæ obtectæ*, Macalister) is sometimes given to the *grey* or *lateral longitudinal striæ* on the upper or dorsal surface of the corpus callosum—(see Fig. 1198, p. 780). The *tæniæ*

telarum of the author are shown in the figures on p. 784 and p. 785.

393 *External or Superficial Arched or Arcuate Fibres* (Fig. 1208, p. 786).—These are divided by Von Langer and Toldt into two groups—*anterior* and *posterior*. The former group consist of the fibres usually spoken of in England as the *outer* or *superficial arched fibres* without further qualification, which emerge from the anterior median fissure, and pass backwards over the pyramid and olive to join the restiform body. According to Quain, they decussate in the raphe of the medulla oblongata, "but their further course is not certainly known." Von Langer and Toldt state that they arise from the nuclei of the funiculus gracilis and the funiculus cuneatus. "The *posterior external arched fibres* pass directly from the nuclei of the funiculus gracilis and the funiculus cuneatus to the surface of the restiform body of the same side" (*op. cit.*, p. 614). These *posterior* arched fibres are not mentioned by Quain.

394 *Decussation of the Fillet* (Figs. 1208, 1209, p. 786).—This decussation has received very various names. "Rather unfortunately," as Gowers says, it has been called the *superior pyramidal decussation;* less objectionable is the shorter name, *superior decussation;* but this is not sufficiently distinctive. Macalister calls it the *sensory pyramid crossing*, in which the misleading analogy with the pyramids is once more alluded to. The name *sensory decussation*, also, is in common use. But the name used in the text, *decussation of the fillet*, the English equivalent of the Continental *decussatio lemniscorum*, is greatly to be preferred.

395 **Cerebello-olivary Fibres* (Fig. 1210, p. 787).—At the end of their description of the medulla oblongata, Von Langer and Toldt describe the above-named fibres in the following terms (*op. cit.*, p. 614): "Finally, we must mention a tract of fibres of considerable size, which does not appear on the surface of the medulla, but forms an important constituent of the restiform bodies. This tract takes origin in the nerve cells of the inferior olivary nucleus, traverses the white centre of that nucleus, and emerges at its hilum; it then crosses the median plane, and enters the opposite olivary nucleus. After passing through this latter, it passes upwards and backwards into the restiform body, and thus to the cerebellum. The tract in question is known as the **fibræ cerebello-olivares*." This name is not used by Quain, but the fibres are described by that author in his account of the *nucleus of the olivary body*. "The open part of the hilum of this nucleus," he writes (*op. cit.*, vol. iii., part i., p. 56), "looks towards the middle line and receives a considerable tract of white fibres, which emanate from the raphe, being derived to all appearance from the opposite olive, and pass into the hilum along its whole extent, forming the so-called *olivary peduncle*. The fibres of the olivary peduncle are partly lost in the grey matter of the olivary nucleus, but mostly pass in small bundles through the lamina, those which are more posterior turning backwards and coursing obliquely through the posterior part of the lateral area to join the restiform body and thus to pass to the cerebellum as internal arched fibres. Others after coursing through the grey lamina . . . reach the surface . . . and are continued as part of the layer of external arched fibres into the restiform body. Through the restiform body, the arched fibres, and the fibres of the olivary peduncles, the cerebellar hemisphere of one side is connected, therefore, with the olivary nuclei of both sides. But the connection with the opposite side is the more intimate."

396 **Pyramidal Nucleus* (Fig. 1210, p. 787).—"In the region of the pyramids, small deposits of grey matter are also met with, the **pyramidal nuclei*, **nuclei pyramidis*, the number and location of which is not constant; most frequently they are met with toward the posterior part of the pyramid, near the olivary nucleus" (Von Langer and Toldt, *op. cit.*, p. 613). It must be noticed that the **pyramidal nucleus* depicted in Fig. 1210 is a distinct grey nucleus from the *internal accessory olivary nucleus* shown in Figs. 1208, 1209, which latter is sometimes called the *pyramidal nucleus* by English authors.

397 *Crustal Bundle of the Fillet* (Figs. 1212, 1213, p. 788).—It is to be regretted that neither Toldt nor Quain gives any distinctive name to this fasciculus. The latter authority describes it in the following terms (*op. cit.*, vol. iii., part i., p. 103): "The fibres of the mesial fillet nearest to the middle line separate themselves from the rest, and pass at the lower part of the mesencephalon into the crusta, where they form a mesial bundle (Wernicke), which is traceable up into the subthalamic region, where it joins the ansa lenticularis." This bundle contains, according to Spitzka, the afferent cerebral tracts of the cranial nerves (*op. cit.*, p. 101). Gowers describes this fasciculus still more briefly: "One small bundle of fibres in the inner part of the crusta differs from the rest. As it descends it passes backwards into the tegmentum and joins the fillet. Its further relations have not been traced" ("Diseases of the Nervous System," 2nd ed., 1893, vol. ii., p. 32). I would suggest the adoption of the name **crustal bundle of the fillet* (see Figs. 1212, 1213, and 1225).

398 **Nucleus of the Lateral Fillet* (Fig. 1213, p. 788).—The name *nucleus lemnisci lateralis* occurs in two different figures of this work, viz., in the section of the mid-brain depicted in Fig. 1213, p. 788, and in the diagram of the tract of the fillet in Fig. 1225, p. 796. In Von Langer and Toldt's "Anatomy" (p. 657), the connexions of the *lemniscus lateralis* (*acusticus*)—the *lower* or *lateral fillet*—are thus described: "It arises for the most part from the trapezium, but in addition from the *nucleus of the fillet* [*Schleifenkern*—no Latin equivalent is given] situate posterior to the external or *dorsal accessory olivary nucleus, and further is reinforced by fibres from the auditory striæ of the auditory triangle of the opposite side. The indirect continuation of this tract passes through the lower brachium of the quadrigeminal bodies to the internal corpus geniculatum, and thence to the cortex of the temporal lobe (*central tract of the auditory nerve*)." The **nucleus lemnisci lateralis* shown in Fig. 1213 is altogether too remote from the accessory olivary nuclei for its identification with the *nucleus of the fillet* described in the above quotation. In Fig. 1225, on the other hand, the *nucleus lemniscus lateralis* is figured more than half an inch below the inferior quadrigeminal body, beneath which it appears in the section depicted in Fig. 1213; and yet it is still a considerable way above the level of the accessory olivary nuclei. The connexions of the lower end of the lateral fillet, as shown in Fig. 1225, with the trapezium, the auditory striæ (through the upper olivary nucleus), and with the "nucleus lemnisci lateralis," lead us in this case, however, to identify the latter with the *nucleus of the fillet* mentioned in the quotation from Von Langer and Toldt's "Anatomy." The fact that Fig. 1225 is diagrammatic will not suffice to account for the discrepancy between Figs. 1213 and 1225, and it seems probable that the *nucleus lemnisci lateralis* of the former figure is an *upper* nucleus of the lateral fillet, an outlying portion of the nucleus of the lower quadrigeminal body; while the *nucleus lemnisci lateralis* of Fig. 1225 is a *lower* nucleus of the lateral fillet, viz., the medullary nucleus before mentioned adjacent to the external accessory olivary nucleus. Quain (*op. cit.*, vol. iii., part i., p. 104) states that according to Edinger some of the fibres of the fillet

"have a cell-station in a special group of nerve cells (upper nucleus of the fillet) at the level of the inferior corpora quadrigemina." Gowers, again (*op. cit.*, vol. ii., p. 36), writing of the different sets of fibres of the fillet, says: "Some fibres go to the posterior corpus quadrigeminum. . . . Others end in a collection of grey matter lying outside the junction of the two corpora quadrigemina, the *nucleus lemnisci* of Flechsig and Bechterew." The identification of Edinger's *upper nucleus of the fillet* with Flechsig and Bechterew's *nucleus lemnisci*, and the identification of both with the *nucleus lemnisci lateralis* of Fig. 1213 in Toldt's Atlas seems plausible; but the descriptions of Quain and of Gowers are too brief to allow of any certainty in the matter.

[399] *Tegmental Decussation* (Fig. 1214, p. 789).—This term (*decussatio tegmentorum* in the author's nomenclature) is by some writers on anatomy used to denote the decussation of *all* fibres that cross the median plane within the boundaries of the tegmentum. In this work, however, the *decussation of the brachia conjunctiva or superior peduncles of the cerebellum* (*decussatio brachii conjunctivi* in the author's nomenclature—see Fig. 1172, p. 764, Fig. 1187, p. 772, Fig. 1213, p. 788, and Fig. 1226, p. 797) is not included in the *tegmental decussation*, the latter term denoting the decussation of those tegmental fibres only which do not belong to the superior peduncles of the cerebellum.

[400] *Strata of the Upper or Anterior Quadrigeminal Bodies* (Fig. 1214, p. 789).—According to Quain's account of the structure of these bodies (*op. cit.*, vol. iii., part i., pp. 106, 107): "Most externally or uppermost is a thin layer of superficial neuroglia, containing no nerve cells or fibres. . . . Excluding this neuroglia layer, and also the central grey matter around the Sylvian aqueduct [*stratum griseum centrale* in Toldt's nomenclature], Tartuferi distinguishes four strata in vertical sections." These strata are: (1) Stratum zonale: superficial white layer. (2) Stratum cinereum: grey cap. (3) Stratum albo-cinereum superius: upper grey-white layer; or stratum opticum. (4) Stratum albo-cinereum inferius: deep grey-white layer; or stratum lemnisci. Von Langer and Toldt, on the other hand (*op. cit.*, p. 628), describe three layers only in this region: (1) Stratum zonale; (2) stratum griseum colliculi superioris; and (3) stratum album profundum. The *first* is certainly identical with the *stratum zonale* of Quain. The *third*, described as "a white lamella forming the lower boundary of the quadrigeminal layer," is shown by Fig. 1214 to be identical with the *stratum lemnisci* of Quain. The *second* would appear to comprise Quain's second and third layers—the *stratum cinereum* and the *stratum opticum*. The latter is the layer of fibres seen in Fig. 1214 arching outwards towards the inferior or posterior brachium. These fibres do not, however, pass into this brachium, but into the superior or anterior brachium, being continued through this body into the optic tract. Lines indicating the *optic layer* and the *layer of the fillet* have in this edition been added to Fig. 1214.

[401] *Radiation of the Corpus Striatum* (Fig. 1216, p. 790).—This term is not used by Quain. Von Langer and Toldt write (*op. cit.*, p. 655): "It must be mentioned as a fact of great importance, that the outer zone of the lenticular nucleus, as well as the corpus striatum [*i.e.*, the caudate nucleus—see note [1] to p. 766], must be regarded as functionally representing a portion of the cortex cerebri, not only in respect of its mode of origin, but also because the nerve fibres entering this nucleus terminate in its nerve cells. But if, nevertheless, from both these basal ganglia, radiating nerve fibres pass to the cortex of the frontal and parietal lobes, forming the *radiatio corporis striati*, these fibres may with great probability be regarded as *association fibres*, homologous with those known to connect different regions of the cerebral cortex." In Ellis's "Demonstrations of Anatomy," 10th ed., p. 227, the fibres of the corona radiata are said to be of two kinds, viz., "those extending without interruption from the cortex to the isthmus cerebri, and those uniting the cortex with the corpus striatum and optic thalamus." The fibres of the corona radiata that unite the cortex with the corpus striatum constitute the **radiation of the corpus striatum* of Toldt. Gowers, on the other hand, writes ("Diseases of the Nervous System," 2nd ed., vol. ii., p. 41): "It is doubtful whether the corpus striatum has any connexion with the cortex, and the old hypothesis that its cells interrupt the fibres which conduct motor impulses seems to be altogether wrong. Meynert thought that many fibres pass from the caudate nucleus to the cortex; but the researches of Wernicke and others make this connexion very doubtful." It is, of course, the views of Meynert that are embodied in the above quotation from Von Langer and Toldt.

[402] *Subthalamic Tegmental Region* (Fig. 1219, p. 792).—This, the forward prolongation of the tegmentum beneath the posterior part of the optic thalamus, is the *stratum intermedium* of the Continental nomenclature, forming the principal portion of the *pars mamillaris hypothalami* of the same nomenclature (see Appendix, note [354]). The German vernacular name for this part of the brain is *Zwischenschicht*, which corresponds roughly with the English *transitional region*, an alternative name for the somewhat cumbersome term *subthalamic tegmental region*. (It must be noted that Quain uses the term *stratum intermedium* in an entirely different sense, viz., to denote the deepest fibres of the crusta, those immediately adjacent to the substantia nigra.) The subthalamic tegmental region was divided by Forel into three layers. The *uppermost*, *stratum dorsale*, "consists chiefly of fine longitudinal fibres, prolonged from the posterior longitudinal bundle according to Meynert, or from the fibres enclosing the tegmental nucleus according to Forel, possibly from both sources. The red nucleus of the tegmentum is prolonged into its posterior part, and from this a considerable number of fibres stream into the internal medullary lamina of the thalamus, and a well-marked bundle passes across the internal capsule to the lenticular nucleus" (Quain, *op. cit.*, vol. iii., part i., p. 114). The name *stratum dorsale* is not used by Toldt, but the bundle of fibres last mentioned is shown in Fig. 1219, p. 792, as the **fasciculus from the tegmental tract to the lenticular nucleus* ("*Haubenbündel zum Linsenkern*"). The *lowermost* layer of the subthalamic tegmental region is formed by the *corpus subthalamicum*, or *nucleus of Luys* (*nucleus hypothalamicus*, vel *corpus Luysi*, according to Toldt—see Fig. 1219, p. 792). This "has here taken the place of the substantia nigra, lying next to the prolongation of the crusta, the fibres of which are seen at the side of the subthalamic tegmental region forming the internal capsule" (Quain, *op. cit.*, *loc. cit.*). The *middle* layer of this region, known as the *zona incerta*, "is a reticular formation prolonged from that of the tegmentum; it passes anteriorly into the substantia interansalis" (*op. cit.*, *loc. cit.*). This layer is ignored by Toldt.

[403] **Grey Portion of the Hypothalamus* (Fig. 1220, p. 792).—There is no allusion to the **pars grisea hypothalami* in Von Langer and Toldt's "Anatomy," nor does Quain give any distinctive name to this portion of the brain. The latter author, however, alludes to it in the following terms (*op. cit.*, vol. iii., part i., p. 112): "The lower surface of the thalamus is continuous posteriorly with the prolongation of the tegmentum (*subthalamic tegmental region*), but in front this prolongation inclines to the outer side, and becomes lost in a layer of grey matter which is continuous internally with the grey matter of

the floor of the ventricle, and is seen at the base of the brain as the anterior perforated lamina." These connexions are well shown in Fig. 1220. Regarding the hypothalamus in general see Appendix, note [354], and regarding the subthalamic tegmental region see note [402] above.

[404] *Nomenclature of the Parts of the Internal Capsule* (Fig. 1223, p. 794).—"In horizontal sections the internal capsule shows a bend (*genu*) opposite the stria terminalis, the anterior third forming an angle of about 120° with the posterior two-thirds; these two parts are known as the *anterior* and *posterior segments* respectively" (Quain, *op. cit.*, vol. iii., part i., p. 136). In the official German nomenclature, the anterior segment is the *pars frontalis capsulæ internæ;* the posterior, *pars occipitalis capsulæ internæ*. In the German vernacular these are *vorderer Schenkel* and *hinterer Schenkel* respectively; and in England they are more often denoted by the equivalent terms *anterior limb* and *posterior limb*, respectively, than by the name *segment* used by Quain. As regards the *genu capsulæ internæ*, Gowers remarks (*op. cit.*, vol. ii., p. 27): "The angle at which the limbs of the capsule join is called its *elbow* or *knee*. . . . Such a bend (as in a pipe) is termed a 'knee' in Germany, an 'elbow' in this country. It is perhaps better to term the junction the *angle* of the capsule." The three parts of the capsule are seen as above described in Fig. 1223, p. 794.

[405] *Tegmental Region and Tegmental Tract* (Fig. 1225, p. 796).—That the diagrammatic representation of the fibres of the tegmental system given in Figs. 1225 and 1226 may be more readily understood, I condense an account of this system from Von Langer and Toldt's "Anatomy," 10th ed., pp. 663-665. Those desiring a more detailed account both of the tegmental system and the pedal system (pyramidal tract, etc.) should refer to Foster's "Physiology," 6th ed., pp. 984-994): The *tegmental tract* (*Haubenbahn*) is thus named because its fibres traverse the tegmentum of the cerebral peduncle. Its component parts have, however, a far wider range than this, comprising what is known as the *tegmental region* (*Haubengegend*). This region includes: (1) The parts bordering the calamus scriptorius (lower limit of the region); (2) the dorsal segment of the medulla oblongata; (3) the dorsal segment of the pons; (4) the tegmentum of the cerebral peduncle; (5) that part of the interbrain known as the subthalamic tegmental region (*stratum intermedium* of Toldt—see note [402] above—upper or anterior limit of the tegmental region); [we must add (6) what Gowers calls the *tegmental radiation—i.e.*, the uppermost fibres of the sensory path as they radiate to the cortex from the hindermost third of the posterior limb of the internal capsule]. The most important structures forming the tegmental tract are: The nuclei of the slender and cuneate columns, the fillet, the formatio reticularis, the red nucleus, the nucleus of Luys, and the ansa lenticularis; but, since a portion of the tegmental tract traverses the cerebellum, we must include the restiform body, the dentate nucleus, and the superior peduncle of the cerebellum. The tegmental tract consists of two portions—a ventral and a dorsal. The *ventral portion* consists chiefly of the *tract of the fillet*, connected below with the nuclei of the slender and cuneate columns, passing above in part to the tegmental radiation already mentioned, in part to the corpora quadrigemina, the optic thalamus, and the globus pallidus; it also includes the *tegmental fasciculi of the posterior commissure*, which, after crossing in this commissure to the opposite side of the brain, join the mesial nucleus of the optic thalamus. The *dorsal portion* consists of fibres which arise in the nuclei of the slender and cuneate columns, pass as arched fibres to the restiform body, thence to the nucleus dentatus of the cerebellum, and onwards from there into the superior peduncle of the cerebellum; with this peduncle the fibres of the tract decussate, pass through the red nucleus, and thence through the subthalamic tegmental region to their destination; a few of these fibres also pass into the internal capsule, but for the most part they terminate in the corpora quadrigemina, the optic thalamus, and the globus pallidus. See also note [406] below.

[406] *Classification of the Fibres of the Cerebral Hemispheres* (Ibid.).—The fibres of the medullary centres of the hemispheres may be arranged in three principal groups. A. *Projection fibres* (*Leitungssystem*), which pass from the isthmus encephali to the hemispheres or *vice versâ;* the most important divisions of these are: (1) the *pedal system* with the *pyramidal tract* (Fig. 1229), and (2) the *tegmental system* with the *tegmental tract* (Figs. 1225 and 1226; also see note [405] above). B. *Transverse or commissural fibres* (*Commissurensystem*), which connect the cortex of the two hemispheres; these comprise: (1) the *anterior commissure* (Fig. 1230, and note [408] below), the principal cerebral commissure in all vertebrates below mammals, and (2) the *corpus callosum* or *great commissure* (Fig. 1230), which appears first in the lower mammals, and is enlarged proportionately with the development of the mantle (see note [6] to p. 760). C. *Association fibres* (*Associationssystem*), which connect different parts of the cortex of the same hemisphere; these are: (1) *short association fibres* (*fibræ propriæ*, Meynert; *laminæ arcuatæ gyrorum*, Arnold; *fibræ arcuatæ cerebri*, Toldt—see Fig. 1231), which connect adjacent gyri, and (2) *long association fibres* (Fig. 1231), which connect more widely separated portions of the grey matter of the hemispheres. These latter fibres are mostly collected into definite bundles, the principal being the following: (*a*) The *superior association bundle* (*superior longitudinal fasciculus* or *bundle; fasciculus longitudinalis superior*, Toldt; *fasciculus arcuatus*, Burdach), sagittal fibres, passing from the frontal to the occipital and temporal lobes; (*b*) the *inferior association bundle* (*inferior longitudinal fasciculus* or *bundle; fasciculus longitudinalis inferior*, Toldt; *temporo-occipital bundle*), running along the outer wall of the posterior and descending horns of the lateral ventricle, and connecting the occipital and temporal lobes; (*c*) the *anterior association bundle* or *uncinate fasciculus* (*fasciculus uncinatus*, Toldt), which curves round the bottom of the Sylvian fissure near the limen insulæ, and serves to connect the third frontal gyrus with the temporal lobe and the anterior part of the limbic lobe; (*d*) the *cingulum* (also known as the *fillet of the corpus callosum* and as the *covered band of Reil*), the principal association bundle of the gyrus fornicatus: its fibres terminate in the cortex of the outer surface of the hemisphere, which they connect with the hippocampal and callosal gyri (Beevor); (*e*) the *perpendicular fasciculus* (Wernicke—not mentioned by Toldt), which connects the inferior parietal lobule with the fusiform lobule; (*f*) the *fornix*, which connects the hippocampal region of the limbic lobe with the corpus albicans, and is commonly stated to be continued to the thalamus as the bundle of Vicq d'Azyr. The connexion between the fibres of the fornix and the bundle of Vicq d'Azyr is, however, denied by Gudden and Forel.

[407] *Nucleus of the Third Nerve* (Fig. 1228, p. 799).—Quain divides the nucleus of the third nerve into parts in a manner considerably more elaborate than that shown by Toldt in Fig. 1228. I have, therefore, not attempted to harmonize the nomenclature of these two authors, but have merely given a literal translation of the terms used by Toldt.

[408] *Parts of the Anterior Commissure* (Fig. 1230, p. 801).—By Von Langer and Toldt these are called simply *anterior* and *posterior* portions respectively. Quain, however, writes (*op. cit.*,

vol. iii., part i., p. 164): "The fibres of the anterior commissure which pass into the temporal lobe form by far the greater part of the commissure in man, and constitute what has been termed by Ganser the *pars temporalis*. Besides these fibres, there are others which are derived from the lobus olfactorius, and which appear to connect the olfactory tract of one side with the hippocampal gyrus of the opposite side. These form the *pars olfactoria* of Ganser; this part is very slightly developed in man." See also note [406] above.

[409] *Reservoirs of Subarachnoid Fluid* (Fig. 1232, p. 802).—Quain uses Latin names for these, and gives no complete list of English equivalents; the English names in the text are, therefore, for the most part supplied by the translator. Quain enumerates the *cisternæ arachnoideales* as follows: Cisterna cerebellomedullaris (directly continuous with the subarachnoid space of the spinal cord), cisterna pontis media *seu* basilaris and cisternæ pontis laterales, cisterna interpeduncularis, cisternæ peripedunculares, cisterna chiasmatis (behind the optic chiasma), cisterna laminæ cinereæ (in front of the chiasma), cisternæ fossæ Sylvii, and cisterna corporis callosi. Of these, the cisterna cerebellomedullaris, the cisterna interpeduncularis, and the cisterna chiasmatis are identical with those given the same name by Toldt; the cisterna pontis media *seu* basilaris of Quain is identical with the cisterna pontis of Toldt, while the cisternæ pontis laterales of Quain are not depicted by the German author, nor is the cisterna peripeduncularis visible in Fig. 1232, which represents a median sagittal section; the cisterna laminæ cinereæ of Quain is merged in the cisterna fissuræ cerebri lateralis of Toldt, which for the rest is equivalent to the cisterna fossæ Sylvii of the English anatomist; the cisterna venæ cerebri magnæ of Toldt represents the posterior extremity of Quain's cisterna corporis callosi, the greater part of which, however, lying above the corpus callosum, is not indicated in Fig. 1232. "These spaces," writes Quain (*op. cit.*, vol. iii., part i., p. 188), "are all in free communication with one another, being only partly separated by imperfect septa of subarachnoid tissue. They receive the subarachnoid clefts (*flumina*) which follow the course of the great fissures (Rolandic, Sylvian, parallel, etc.), and which themselves receive the clefts which follow the course of the secondary and tertiary fissures (*rivi* and *rivuli* of Duret)."

[410] *Lateral and Sigmoid Sinuses* (Fig. 1233, p. 803).—In this work the denotation of the term *lateral sinus* is restricted to that portion of the *lateral sinus* of most English authors which is in contact with the occipital and parietal bones, the remaining, temporal, portion of the *lateral sinus* of English authors being here called the **sigmoid sinus*. This matter is more fully explained in the Appendix to Part V., note [264].

[411] *Diaphragma Sellæ and Foramen Diaphragmatis Sellæ* (Fig. 1234, p. 804).—The layer of the dura mater which forms the roof of the pituitary fossa (see note [2] to p. 60, in Part I.) has been somewhat variously named. Toldt's name, *diaphragma sellæ*, is sometimes used in England; the *foramen diaphragmatis sellæ* is the central aperture in the diaphragm through which the infundibulum passes to the pituitary body. According to Quain (*op. cit.*, vol. iii., part i., p. 182), "the portion of dura mater which stretches over the sella turcica, and, pierced by a small hole for the infundibulum, covers the pituitary body, is sometimes spoken of as the *operculum*, or *tentorium of the hypophysis*." According to Macalister (*op. cit.*, p. 530), the dura mater "forms a shelf-like *pituitary diaphragm* with a small central hole for the infundibulum." In this work I have chosen the names *pituitary diaphragm* and *orifice of the pituitary diaphragm* as the English equivalents of *diaphragma sellæ* and *foramen diaphragmatis sellæ*, respectively (see Fig. 1234, p. 804, Figs. 1235 and 1236, p. 805, and Fig. 1239, p. 808).

[412] **Notch of the Tentorium* (Figs. 1235, 1236, p. 805).—The somewhat inappropriate name of *superior occipital foramen* is applied by Macalister to what Toldt calls the *incisura tentorii*, viz., the aperture bounded behind and laterally by the free margin of the tentorium, through which the isthmus encephali passes with the basilar artery and the third and fourth cranial nerves. The *inferior occipital foramen* is better known as the *foramen magnum*.

[413] *Posterior Cutaneous Branches* (Fig. 1240, p. 810).—These are the cutaneous offsets of the posterior primary divisions of the spinal nerves, being the terminal portions of these nerves which reach the integument after passing through and supplying the muscles of the back. Fig. 1240 is diagrammatic, and it must not be supposed that as an actual fact from both the external and the internal branch of the posterior primary division of each dorsal nerve a posterior cutaneous branch is derived, giving external and internal offsets. According to Von Langer and Toldt (*op. cit.*, p. 678), "the *posterior cutaneous branches, rami cutanei dorsales*, proceed in the case of the posterior primary divisions of the upper dorsal nerves from the inner branches only, whereas in the case of the posterior primary divisions of the lower dorsal nerves the outer branches furnish the largest cutaneous offset." It must be observed that the terms *internal branch* and *external branch* (of the posterior primary division) are not, strictly speaking, the English equivalents of *ramus cutaneus dorsalis medialis* and *ramus cutaneus dorsalis lateralis*, respectively; but in Fig. 1240 the author has applied these Latin names to the *posterior cutaneous branches* before their emergence from the muscles, and in the case of the *ramus medialis* even before the origin of the muscular branch.

[414] *Intercostal Nerves* (Ibid.).—The upper six intercostal nerves, the distribution of which is confined to the parietes of the thorax, are sometimes distinguished as the *pectoral intercostal nerves;* the lower six, the anterior terminal branches of which supply the anterior wall of the abdomen, are similarly distinguished as the *abdominal intercostal nerves*. The twelfth nerve, being situate below the last rib, and therefore wholly contained in the abdominal wall, is for this reason sometimes called the *subcostal nerve*.

[415] **Ansæ* (Fig. 1243, p. 812).—"Exact enumeration of the nerve fibres [of the roots of the spinal nerves] has shown that the total number of entering and emerging fibres is the same on the two sides of the spinal cord, but it has further established that the individual roots of any one pair do not always contain the same number of fibres on both sides, and that the root-bundles are therefore often asymmetrical. Hence it happens that a particular nerve fibre does not always emerge in the same root; none the less, owing to the fact that their destinations are constant, aberrant fibres are by means of anastomoses reconducted into their appropriate paths. Anastomoses of this character are met with as high up as the nerve roots themselves; they are especially common between the cervical nerve roots, and are found more frequently connecting the sensory than connecting the motor nerve roots. Such anastomoses between the nerve roots are known as *ansæ* (loops)" (Von Langer and Toldt, *op. cit.*, p. 586). Quain says merely (*op. cit.*, vol. iii., part ii., p. 276) that "communications between the root filaments (especially the posterior) of adjoining nerves, are frequently met with"; but the term *ansæ* is not used by this author.

[416] *Third Occipital Nerve* (Fig. 1245, p. 813).—"From the cutaneous branch of [the internal branch of the posterior primary division of] the third [cervical] nerve an offset passes upwards

to the integument on the lower part of the occiput, lying at the inner side of the great occipital nerve; this is sometimes called the *third occipital nerve.*" Quain (*op. cit.*, vol. iii., part ii., p. 280) thus describes this nerve as normal, though Toldt calls it a *variety.* It is not mentioned by Von Langer and Toldt in their "Anatomy."

[417] *Mammary Branches* (Fig. 1247, p. 815).—"From the *lateral* and *anterior cutaneous nerves of the thorax* special offsets are furnished to the mammary gland, the *outer mammary branches* being derived from the anterior branches of the lateral offsets of the fourth, fifth, and sixth intercostal nerves, and the *inner mammary branches* from the external branches of the anterior (terminal) offsets of the third and fourth intercostal nerves" (Von Langer and Toldt, *op. cit.*, p. 682).

[418] *Subscapular Nerves* (Ibid.).—There are usually three *subscapular nerves.* That which supplies the upper part of the subscapularis muscle, the smallest of the three, is the *upper subscapular nerve;* that which supplies the latissimus dorsi muscle, the largest of the three, is called by Quain the *middle* or *long subscapular nerve*, by Macalister the *long subscapular nerve*, and by Toldt *N. thoracodorsalis;* that which supplies the teres major muscle and the lower part of the subscapularis muscle is called by Quain the *lower subscapular nerve*, and by Macalister the *middle subscapular nerve.*

[419] *Communicating Cervical Nerves* (Fig. 1248, p. 816).—These are the branches from the second and third cervical nerves, respectively, which join the *descending cervical nerve* (*descendens noni*—see note [420] below) in the *ansa cervicalis* (see Fig. 1249, p. 817). There appears to be no complete Latin name for these branches in the author's terminology. He calls them *communicating branches to the ramus descendens nervi hypoglossi.*

[420] *Descending Cervical Nerve* (Fig. 1249, p. 817).—Macalister denotes this nerve by the Latin name *nervus descendens cervicis.* It is, however, still very commonly known by the old name of *descendens noni*, the hypoglossal nerve, the twelfth cranial nerve of Soemmerring, being the ninth cranial nerve, *nervus nonus*, in the enumeration of Willis.

[421] *Ansa Cervicalis* (Ibid.).—This loop, formed by the union of the *descending cervical nerve* (see note [420] above) with the *communicating cervical nerves* (see note [419] above), is often known in England by the name used by Toldt, *ansa hypoglossi.* This name, indeed, is more distinctive than the name *ansa cervicalis*, used by Quain, and the name *ansa infrahyoidea*, used by Macalister.

[422] *Cardiac Branches of the Pneumogastric Nerve* (Ibid.).—The *cervical cardiac branches* of the vagus arise both at the upper and the lower part of the neck. The *upper cervical cardiac branches* are small filaments which join the cardiac branches of the sympathetic; these are ignored in Toldt's nomenclature, and for this reason the *lower cervical cardiac branch* of the vagus, which arises at the lower part of the neck, is called by him *ramus cardiacus superior nervi vagi.* The *thoracic cardiac branches* of the vagus (on the left side usually arising from the inferior or recurrent laryngeal nerve) are by Toldt called *ramus cardiacus inferior nervi vagi.*

[423] *Great Auricular Nerve* (Fig. 1250, p. 818).—In addition to *facial* and *auricular branches*, corresponding respectively to the *ramus anterior* and *ramus posterior* of Toldt, the *great auricular nerve* commonly sends an offset to the integument over the upper part of the sternocleidomastoid muscle and the mastoid process, which is separately named by Quain the *mastoid branch.* This branch is not accounted for in Toldt's nomenclature. Sometimes it is a separate offset of the cervical plexus, ascending between the great auricular and small occipital nerves.

[424] **Phrenico-abdominal Branch* (Fig. 1252, p. 820).—"Some of the offsets of the phrenic nerve, *rami phrenico-abdominales*, pass through the caval and œsophageal openings in the diaphragm, and also on the left side in front of the central tendon between the muscular fasciculi. For the most part these filaments are lost in the crura of the diaphragm, but some pass to the serous investment of the liver and to the cœliac plexus. The distribution of the phrenic nerve shows that it is not exclusively motor in function" (Von Langer and Toldt, *op. cit.*, p. 681). A description of these terminal offsets of the phrenic nerve is given by Quain, but neither this author nor Macalister makes use of the name **phrenico-abdominal branches.*

[425] **Posterior Thoracic Nerves* (Fig. 1253, p. 821).—In the German official nomenclature the name *nervi thoracales posteriores* is a general name for the *n. dorsalis scapulæ* and *n. thoracalis longus*, the *nerve to the rhomboid muscles* and the *posterior thoracic nerve* of English authors. The latter nerve was formerly known as the *external respiratory nerve of Bell.*

[426] *Cords of the Brachial Plexus* (Fig. 1255, p. 823).—These are usually distinguished as *outer*, *inner*, and *posterior*, corresponding strictly to the *fasciculus lateralis*, *fasciculus medialis*, and *fasciculus posterior* of Toldt's nomenclature. Sometimes, however, the *outer cord* is called the *upper cord*, and the *inner cord* the *lower cord*, of the brachial plexus.

[427] *Nerve to the Inner Head of the Triceps and Ulnar Collateral Nerve* (Ibid.).—The *nerve to the inner head of the triceps* divides into an upper, short branch, which passes immediately to the muscle, and a lower, long branch, "the *ulnar collateral*, which descends so close to the ulnar nerve that it often appears to join it." (Macalister, *op. cit.*, p. 298). Separating from the ulnar nerve a little above the elbow, it enters the lower short fibres of the internal or deep head. The name of *ulnar collateral* nerve was given to this long filament by Krause.

[428] (Ibid.) According to Quain, the cutaneous area supplied by the musculocutaneous nerve lies entirely below the elbow, and the skin on the outer side of the elbow, to which in the specimen shown in Fig. 1255 a branch is furnished by the musculocutaneous nerve, is, according to Quain, normally supplied by the *upper external cutaneous branch* of the *musculospiral nerve* (*nervus cutaneus brachii posterior* of Toldt).

[429] *Cutaneous Branches of the Musculospiral Nerve* (Fig. 1256, p. 824).—These are usually described by English anatomists as three in number: (1) *Internal cutaneous branch of the musculospiral nerve* (*posterior internal*, or *superior* branch, according to Macalister), arising in the axilla, often in common with the nerve to the inner head of the triceps (see note [427] above), and supplying the skin over the long head of the triceps muscle and behind the cutaneous area of the intercostohumeral nerve—this branch is identified by Quain with the *n. cutaneus brachii posterior* of the Continental nomenclature; (2) the *upper external cutaneous branch*, which supplies the lower half of the upper arm on its outer and anterior aspects (see Figs. 1270 and 1271, p. 835); (3) the *lower external cutaneous branch* (this branch and the previous one, which often arise in common from the main trunk, are called by Macalister the *posterior external cutaneous branch of the musculospiral nerve*), which supplies the outer half of the back of the forearm. Toldt ignores entirely the *internal cutaneous* offset of English anatomists, and describes two cutaneous branches only of the musculospiral nerve: the *nervus cutaneus brachii posterior*, the *upper external cutaneous branch*, and the *nervus cutaneus antibrachii dorsalis*, the *lower external cutaneous branch*, of the musculospiral nerve. As far, then, as Toldt's use of the German official nomenclature is concerned, Quain's identification of the *nervus cutaneus brachii posterior* with the *internal cutaneous branch of the musculospiral nerve* is erroneous.

[430] *Radial Nerve* (Fig. 1257, p. 825).—It must be carefully noted that the *nervus radialis* of Continental anatomists is the *musculospiral* trunk of English writers. Just above the elbow this trunk divides into two terminal branches; one of these, *ramus superficialis nervi radialis* in the Continental nomenclature, a purely cutaneous nerve, is the *radial nerve* of English authors; while the other, *ramus profundus nervi radialis*, the muscular nerve of the back of the forearm, is known in England as the *posterior interosseous nerve* (see note [431] below).

[431] *Posterior Interosseous Nerve* (Ibid.).—This name is by English anatomists applied to the nerve designated *ramus profundus nervi radialis* by Toldt (see note [430] above); and the name *nervus interosseus* (*antibrachii*) *dorsalis* is used on the Continent in a more restricted sense, as shown by the following quotation (Von Langer and Toldt, *op. cit.*, p. 687): "The *ramus profundus nervi radialis* winds round the neck of the radius, between the layers of the supinator radii brevis muscle, and is for the most part distributed to the muscular bellies in the upper part of the back of the forearm: one offset only, designated *nervus interosseus dorsalis*, extends as far down as the wrist-joint, supplying the three extensors of the thumb and the capsule of the wrist-joint." The pseudo-ganglionic enlargement of the lower end of this nerve is well shown in Fig. 1257.

[432] *Nerve to the Anconeus Muscle* (Ibid.).—According to both Quain and Macalister, this nerve descends to its destination within the substance of the *inner head* of the triceps muscle; but alike in the marginal description and that at the foot of Fig. 1257 the part of the triceps in which the course of the nerve to the anconeus muscle has been traced is called *caput laterale musculi tricipitis brachii*. As a matter of fact, though this part of the triceps is situate on the outer aspect of the muscle, all the fibres arising from the posterior surface of the humerus below and internal to the spiral groove, and even from the back of the lower part of the external intermuscular septum, are regarded as belonging to the *internal* or *deep* head of the triceps, though the outermost of these fibres pass inwards to their insertion into the outer margin of the common tendon. Some of these outer fibres of the internal head are usually continued below into the fibres of the anconeus muscle, and it is under cover of these fibres that the branch of the musculospiral nerve which supplies the latter muscle passes to its destination.

[433] (Fig. 1258, p. 826.) By Quain the terminal branches of the ulnar nerve are termed *superficial part* and *deep part*, respectively; in the text, however, I have followed the author's nomenclature in using the terms *superficial branch* and *deep branch*. More distinctive names would be *superficial terminal* and *deep terminal branch of the ulnar nerve*.

[434] *Palmar Digital Nerves* (Fig. 1260, p. 828).—As in the case of the palmar digital arteries and veins, the author distinguishes between the digital nerves in the palm of the hand (before division) and the digital nerves on the palmar surfaces of the fingers (after division) as *nervi digitales volares communes* and *nervi digitales volares propriæ*, respectively. This distinction is ignored by Quain and Macalister, but I have in the text named the palmar digital nerves before division (*common*) *palmar digital nerves*, and after division *collateral palmar digital nerves*.

[435] *Perforating Branches of the Deep Part of the Ulnar Nerve* (Fig. 1261, p. 829).—The twig to which in Fig. 1261 the name of *perforating branch* is given has no Latin name in the author's terminology, being called merely (in German) *offset to the dorsal surface of the metacarpus*. Quain, however, writes (*op. cit.*, vol. iii., part ii., p. 300: "Rauber describes small *perforating branches*, which accompany the superior perforating arteries in the interosseous spaces, and join the terminal filaments of the posterior interosseous nerve."

[436] **Anterior Brachial Cutaneous Branches of the Internal Cutaneous Nerve* (Fig. 1262, p. 830).—Macalister gives no special name to these branches; and Quain calls them merely *branches to the integument of the arm*, a name insufficiently distinctive. I have therefore used in the text a literal translation of the Latin name employed by the author, *rami cutanei brachii anteriores nervi cutanei antibrachii medialis*.

[437] **Ulnar Communicating Branch* (Fig. 1265, p. 831).—Describing the *dorsal digital branches* of the radial nerve (*ramus superficialis nervi radialis*—see note [430] above), Von Langer and Toldt write (*op. cit.*, p. 687): "A fine branch of communication passes from the nerve to the middle finger to the corresponding offset of the ulnar nerve." Quain describes this communication between the dorsal digital branches of the radial and ulnar nerves respectively, but gives no special name to the communicating branches; and Macalister writes (*op. cit.*, p. 299): "A *communicating branch* (of the radial nerve) joins the dorsal branch of the ulnar, and with it gives a common supply to the cleft between the middle and ring fingers."

[438] *Sacral and Pudic Plexuses* (Fig. 1272, p. 836).—"In the description of the sacral plexus a division is sometimes made into two subordinate plexuses. The larger upper part, which ends in the great sciatic nerve and gives off the other branches to the limb, is distinguished as the *sciatic plexus* (*plexus ischiadicus*), while the smaller lower part, including the pudic nerve together with the visceral and muscular branches of the third and fourth sacral nerves, is designated the *pudic plexus* (*plexus pudendus*)" (Quain, *op. cit.*, vol. iii., part ii., p. 324). It must be observed that the author uses the term *plexus sacralis*, not in the wider sense of the above quotation, but to denote merely what is there called the *sciatic plexus*. This latter term, however, is not current in England, and I have therefore used the name *sacral plexus* as the English equivalent of the *plexus sacralis* of the author. The *pudic plexus* (*plexus pudendus*) comprises a part of the third and nearly all the fourth sacral nerve; its branches are, in addition to the large *pudic* trunk, *muscular branches* to the levator ani and coccygeus muscles and to the external sphincter of the anus (*hæmorrhoidal* or *perineal* branch), and *visceral branches* (*middle hæmorrhoidal*, *inferior vesical*, and *vaginal* nerves). A small filament from the fourth sacral nerve combines with the fifth sacral nerve and the coccygeal nerve to form what is sometimes named the *coccygeal plexus*, and this latter gives rise to the *anococcygeal* or *subcaudal nerve*. The pudic and coccygeal plexuses as described above are treated by Macalister as a single plexus, to which he gives the name of *pudendo-anal plexus*.

[439] *Rami Cutanei Femoris Anteriores* (Fig. 1273, p. 837).—"Among the cutaneous offsets of the anterior crural or femoral nerve are the **anterior cutaneous branches of the thigh*. Two to four in number, they perforate the deep fascia at different levels, and ramify on the front of the thigh; one of these branches accompanies the femoral portion of the internal saphenous vein" (Von Langer and Toldt, *op. cit.*, p. 692). Under this name of **anterior cutaneous branches of the thigh*, the author includes the *middle cutaneous* and *internal cutaneous nerves* of English anatomists. As far as possible, I have in the text discriminated between these nerves, in accordance with the English nomenclature.

[440] *Divisions of the Obturator Nerve* (Fig. 1275, p. 839).—The *anterior* or *superficial part* of the *obturator nerve* (*ramus anterior nervi obturatorii*) and the *posterior* or *deep part* of the *obturator nerve* (*ramus posterior nervi obturatorii*) are by Macalister called *anterior obturator nerve* and *posterior obturator nerve*, respectively.

[441] (Ibid.) The *cutaneous branch of the anterior crural nerve* mentioned in the text may be derived either from the *internal cutaneous* or the *internal saphenous branch* of the *anterior crural* or *femoral nerve*, for *communicating* offsets from both these nerves combine with the *cutaneous branch of the obturator nerve* to form an interlacement beneath the lower end of the sartorius muscle.

[442] *N. Tibialis* (Fig. 1276, p. 840).—In the author's nomenclature, the name *nervus tibialis* is given to the larger of the two terminal branches of the *great sciatic nerve* from the point of division of the parent trunk until the **tibial nerve* itself divides (usually just below the internal annular ligament of the ankle) into the *internal* and *external plantar* nerves. In England, however, the upper part of this nerve, as far as the lower border of the popliteus muscle, is known as the *internal popliteal nerve*, and for the rest of its course it receives the name of *posterior tibial nerve*. Macalister speaks of the terminal branches of the *great sciatic nerve* as the *peroneal* and *popliteal* nerves, respectively; but in his terminology also the latter nerve changes its name to *posterior tibial* at the lower border of the popliteus muscle.

[443] *Inferior Pudendal Nerve* (Fig. 1277, p. 841).—In the specimen shown in Fig. 1277 the name *inferior pudendal nerve* (*rami perineales nervi cutanei femoris posterioris* in the author's terminology) is attached to *two* distinct branches of the small sciatic trunk. These two branches represent the principal branches of distribution of the *inferior pudendal nerve* when the nerve is normal. This variety is frequently met with.

[444] *Calcaneoplantar Nerve* (Fig. 1279, p. 843).—According to Quain (*op. cit.*, vol. iii., part ii., p. 333), "the *calcaneoplantar nerve* is given off by the posterior tibial in the lower part of the leg, and becomes superficial by piercing the internal annular ligament. It divides into *internal calcaneal branches* which ramify in the integument on the inner side of the heel, and *plantar cutaneous branches* which supply the skin of the inner and hinder part of the sole." The *rami calcanei mediales* of Toldt include the *plantar cutaneous* as well as the *internal calcaneal branches* of the *calcaneoplantar nerve;* thus, in Fig. 1279, of the branches labelled *internal calcaneal*, the anterior set are really the *plantar cutaneous branches* of English anatomists.

[445] **Interosseous Nerve of the Leg* (Ibid.).—"The *nerve to the popliteus muscle*, which arises from the internal popliteal nerve near the lower end of the popliteal space, gives off the slender *nervus interosseus cruris;* this descends partly in the substance of the interosseous membrane, partly on the posterior surface of this membrane, which it supplies, giving fine filaments also to the periosteum of the tibia, while its terminal offsets supply the inferior tibiofibular articulation and the ankle-joint" (Von Langer and Toldt, *op. cit.*, pp. 694, 695). In England this small nerve is not usually dignified by the name of **interosseous nerve of the leg*. Quain and Macalister merely state that the *nerve to the popliteus muscle* gives a branch to the interosseous membrane.

[446] *External Terminal Branch of the Anterior Tibial Nerve* (Fig. 1281, p. 845).—The branch in Fig. 1281 labelled *muscular branch to the extensor brevis digitorum pedis muscle*, together with the branches labelled *offsets to the tarsal joints*, represent what is usually known in English anatomical nomenclature as the *external terminal branch of the anterior tibial nerve* (the *internal terminal branch* being that which supplies the dorsal digital nerves of the outer side of the great toe and the inner side of the second toe). The *external terminal branch* resembles the *posterior interosseous nerve* of the forearm in presenting, as a rule, a pseudoganglionic enlargement. This is, however, not shown in Fig. 1281.

[447] *Jugular Ganglion* (Fig. 1296, p. 858).—The *upper ganglion* or *ganglion of the root* of the pneumogastric or vagus nerve, the *ganglion jugulare* of the official German nomenclature, is, owing to its situation in the jugular foramen, sometimes known in England also by the name of *jugular ganglion*. The name is, however, better avoided, since its employment may lead to confusion with the upper ganglion of the glossopharyngeal nerve, which is always known in England by the name of *jugular ganglion* (*ganglion superius nervi glossopharyngei* in the official German nomenclature; sometimes called *Ehrenritter's ganglion* by German writers). This latter is also shown in Fig. 1296, just below the Roman figure IX.

[448] *Visceral Arches and Visceral Clefts* (Fig. 1296, p. 858).—In the German original these structures are called *Kiemenbogen* and *Kiemenspalte*, respectively; literally, *branchial arch* and *branchial cleft*. This name depends on the respiratory function of these structures in the primitive ancestral vertebrates; but since this function is now obsolete, the names used in the text are to be preferred. In England also, however, some anatomists call the clefts *branchial clefts* or *gill-slits;* and of the arches, while the first is the *mandibular arch*, and the second the *hyoid arch*, the remainder are sometimes called *branchial arches*. The *first* or *mandibular visceral arch* sends forward on each side a process from which the upper jaw is formed; this is known as the *maxillary process* (*Oberkieferfortsatz*). The distal portion of the first arch, from which the lower jaw is formed, is by Toldt distinguished as the **mandibular process* (*Unterkieferfortsatz*), but this name is not used by Quain. (The primitive cartilage of the lower jaw is usually called *Meckel's cartilage.*)

[449] *Nasal Nerve* (Fig. 1298, p. 859).—In the German official nomenclature, the *nervus nasociliaris* gives off the *nervus ethmoidalis anterius* through the anterior ethmoidal foramen to the nasal cavity. These form the proximal and distal portions, respectively, of the *nasal nerve* of English authors. The latter is known also as the *oculonasal* and as the *nasociliary nerve*.

[450] **Posterior Nasal Branches* (Fig. 1298, p. 859).—The **rami nasales posteriores* of the official German nomenclature include the following branches in Quain's terminology: (1) the *nasopalatine nerve*; (2) the small *upper nasal branches* of Meckel's ganglion: (3) the *inferior nasal branches* of the large or anterior palatine nerve.

[451] *Canalis Incisivus* (Fig. 1302, p. 862).—The author appears to use this term indifferently of the *canals of Scarpa* and of the *canals of Stensen*. The former transmit the nasopalatine nerves; the latter, the palatine branches of the nasopalatine arteries.—See Macalister, *op. cit.*, p. 635.

[452] *Petrosal Nerves* (Fig. 1303, p. 863).—The *great superficial petrosal nerve* (sometimes called the *white* portion of the Vidian nerve) and the *small superficial petrosal nerve* (*long root of the otic ganglion*) are identical respectively with the *nervus petrosus superficialis major* and *nervus petrosus superficialis minor* of the German official nomenclature. Of the *deep petrosal nerves* of English anatomists, the *great deep petrosal nerve* (sometimes called the *grey* portion of the Vidian nerve) is in the German nomenclature known as the *nervus petrosus profundus* without further qualification. The *small deep petrosal nerve* (a branch from the tympanic plexus to the internal carotid plexus) must be identified with the *nervus caroticotympanicus superior* of the German nomenclature (see Fig. 1317, p. 874, and Fig. 1328, p. 886). Finally, the *external superficial petrosal nerve*, an occasional branch connecting the geniculate ganglion with the sympathetic on the middle meningeal artery, is apparently ignored by Toldt.

[453] *Sublingual Nerve* (Fig. 1304, p. 864).—Macalister distinguishes by this name "a branch which passes external to and supplies the sublingual gland, the gums, and the mucosa beneath the tongue" (*op. cit.*, p. 599). This is the *nervus sublingualis* of the German official nomenclature. Quain says merely that "some delicate filaments are distributed to the sublingual gland."

[454] *Deep Temporal, Buccal, and Masseteric Nerves* (Fig. 1305, p. 865).—The arrangement of these branches of the inferior maxillary nerve being a somewhat variable one, different authors have accepted different arrangements as the normal. Quain describes the *deep temporal nerves* as usually three in number, the *anterior* being given off by the *buccal nerve* after it has perforated the external pterygoid muscle, the *middle* arising independently, and the *posterior* generally conjoined with the *masseteric nerve*. According to Von Langer and Toldt (*op. cit.*), the *buccal nerve* (*n. buccinatorius*) consists of sensory fibres only, and the *deep temporal nerves*, two only in number, *anterior* and *posterior*, and the *masseteric nerve* are independent branches of the inferior maxillary nerve. Macalister also describes two *deep temporal nerves* only, the *anterior* arising a little in front of the *buccal nerve*, and the *posterior* dividing into two branches, the *masseteric* and the *posterior temporal*. A *middle deep temporal nerve* is, however, shown by Toldt in Fig. 1320, p. 877. In the text I have not attempted to harmonize these discrepancies, but have followed Toldt's nomenclature.

[455] **Rami Nasales Interni* (Fig. 1306, p. 866).—The **internal nasal branches* of the *infra-orbital nerve*, supplying the skin just within the margin of the nostril, are not distinguished by Quain from the *lateral nasal branches* of this nerve.

[456] *Mental and Inferior Labial Branches* (Fig. 1306, p. 866).—"The *mental* or *labial nerve*," according to Quain (*op. cit.*, vol. iii., part ii., p. 247), "emerging from the bone by the mental foramen, divides beneath the depressor anguli oris into three parts—an inferior, which descends to the integument of the chin, and two superior, which ascend to the skin and mucous membrane of the lower lip." By this author, however, these branches are not distinguished by the names used in the text.

[457] *Divisions of the Inferior Maxillary Nerve* (Fig. 1307, p. 867).—After giving off the *recurrent* or *middle meningeal branch*, the inferior maxillary nerve divides, about $\frac{1}{8}$ inch below the foramen ovale, into two primary branches, called by Quain the *small, anterior*, or *upper portion*, and the *large, posterior*, or *lower portion*, respectively; and by Macalister, *superior branch* and *inferior branch* respectively. The *large* or *posterior portion*, chiefly sensory in function, divides into three trunks, the *auriculotemporal, lingual*, and *inferior dental nerves*. The *small* or *anterior portion*, chiefly motor, gives, in addition to the *buccal nerve* (sensory in function), the nerves to the temporal, masseter, and external pterygoid muscles (see above, note [454]); for this reason it is known in German as the *nervus masticatorius*. Functionally, the *internal pterygoid nerve* belongs also to the **masticatory nerve;* usually, however, this branch arises from the undivided trunk.

[458] *Sphenomaxillary Muscle* (Fig. 1309, p. 868).—"In the region of the sphenomaxillary fissure, incorporated with the orbital periosteum, there is a layer of smooth muscular fibres, having the appearance of a greyish-red mass. This is the so-called *musculus orbitalis*" (Von Langer and Toldt, *op. cit.*, p. 783). This layer of unstriped muscular tissue was first described by Müller, and sometimes goes by the name of *Müller's muscle*. But Müller also described a layer of unstriped muscular tissue met with in each eyelid, and these layers also go by the name of *Müller's muscle*. (By Toldt they are called *Mm. tarsales superior et inferior*—see Fig. 1386, p. 910, and note [504] below.) Gowers, for instance, writes ("Diseases of the Nervous System," 2nd ed., vol. ii., pp. 886, 887): "The unstriated muscular fibres of Müller, which are innervated by the sympathetic and run from the eyelid to the membranous lining of the orbit, are generally believed to be capable, by their contraction, of causing prominence of the eyeball." On the other hand, when Fagge, writing also on exophthalmos, states: "A third hypothesis is that exophthalmos may in part be caused by contraction of Müller's non-striated orbital muscle" ("Medicine," 2nd ed., vol. i., p. 1011), he refers to the layer of smooth muscular fibres bridging over the sphenomaxillary fissure. To avoid this confusion, the use of the term *Müller's muscle* should be abandoned, and the *musculus orbitalis* of the German official nomenclature should be denoted in England by the name of *sphenomaxillary muscle*. (This name is used by Quain—*op. cit.*, vol. iii., part ii., p. 4, footnote.)

[459] *Superficial Temporal Nerve* (Fig. 1313, p. 870).—According to Quain's nomenclature, the *auriculotemporal nerve*, on emerging from beneath the parotid gland and passing upwards over the zygoma, becomes the *superficial temporal nerve*. In the German official nomenclature, the nerve remains the *nervus auriculotemporalis* until it breaks up into the *rami temporales superficiales* shown in Fig. 1313. The *superficial temporal nerve* of Quain is by Macalister named the *terminal branch* of the auriculotemporal nerve.

[460] **Ansa Cervicalis Superficialis* (Fig. 1313, p. 870).—I mark this term with an asterisk because it is used neither by Quain nor by Macalister. Both of these authors describe the loop or loops of communication, on the outer surface of the sterno-cleidomastoid muscle, between the superficial cervical nerve and the cervical or inframaxillary branch of the facial nerve, but neither denotes the communication by any distinctive name. The drawback to the use in England of the Continental name of *ansa cervicalis superficialis* is that the name *ansa cervicalis* is already in use in this country to denote the loop of communication known on the Continent as the *ansa hypoglossi* (see Fig. 1249, p. 817, and Fig. 1320, p. 877). All possibility of confusion would be avoided if the loop of communication between the *facial* and the *superficial cervical nerves* were to be termed *ansa cervicofacialis*, but as this name is a neologism I have not ventured to incorporate it in the text.

[461] *Pes Anserinus* (Fig. 1314, p. 871).—This is the name usually employed in England to denote the radiating plexus formed in the parotid gland and on the side of the face by the branches of the facial nerve as they pass to their destination. In the German official nomenclature this structure is known as the *plexus parotideus*, the name *pes anserinus* being given on the Continent to an entirely different structure, viz., the aponeurotic expansion of the tendon of insertion of the sartorius muscle.—See footnote to p. 351 in Part III.

[462] *Inferior or Recurrent Laryngeal Nerve* (Fig. 1315, p. 872).—In the German official nomenclature this nerve, at its first origin from the vagus trunk, is known as the *nervus recurrens;* only after it has furnished numerous *tracheal* and *œsophageal branches* does the *terminal branch* (as it is esteemed) of the nervus recurrens receive the name of *nervus laryngeus inferior*. In England the nerve is called indifferently *inferior laryngeal* or *recurrent laryngeal nerve* throughout its whole course.

[463] (Fig. 1315, p. 872).—Sometimes known in England also as the *jugular ganglion* of the vagus nerve. (Macalister makes use of this name.) It is better, however, to reserve the name jugular ganglion for the upper ganglion of the glossopharyngeal nerve. —See also note [447] above.

[464] *Œsophageal Cords, Anterior and Posterior* (Fig. 1315, p. 872).—As this name is used neither by Quain nor by Macalister, I quote the following passage from Von Langer and Toldt (*op. cit.*, p. 716): "The name of *chordæ œsophagea, anterior et posterior*, is given to two nervous trunks, one of which descends along the anterior, the other along the posterior surface of the œsophagus. These trunks are connected by means of numerous offsets, which, as they pass from one trunk to the other, branch and reunite to form the *plexus œsophageus*. From this plexus arise a large number of *rami œsophagei* for the thoracic and abdominal portions of the œsophagus. The œsophageal cords are the continuations of the trunks of the pneumogastric or vagus nerves; they are differentiated from these latter by the fact that each cord receives from the other numerous branches of communication; but, notwithstanding this, the *posterior* œsophageal cord must be regarded as the continuation of the *right* pneumogastric, and the *anterior* œsophageal cord as the continuation of the *left* pneumogastric nerve. This peculiar relation of the œsophageal cords to the œsophagus is brought about by the rotation of the stomach which takes place during intra-uterine life, as a result of which the primitive left side of the stomach becomes the anterior surface, and the primitive right side becomes the posterior surface of that organ.

[465] *Gastric Plexus* (Fig. 1315, p. 872).—Quain and Macalister both speak of the *gastric plexus* as a single whole. Toldt, on the other hand, describes four separate plexuses, *anterior*, *posterior*, *superior*, and *inferior* gastric plexuses. The difference is not one of much importance. It is true that the nerve-supply of the stomach may be said to reach that organ in four sets of branches: to the front of the stomach from the *left pneumogastric*, to the back from the *right pneumogastric nerve* (see note [464] above); to the small curvature from the solar plexus by the branches that accompany the coronary artery of the stomach and form the *coronary plexus*, to the great curvature (also primarily from the sympathetic) by the *right* and *left gastro-epiploic plexuses*. But when we remember that not only do the nerves from these different sources intermingle freely on the walls of the stomach, but further that, by means of the *cœliac branches* of the vagus (see note [466] below), vagal fibres are incorporated with many (if not all) of the branches of the solar plexus, it seems that the *gastric plexus* can be more usefully regarded as forming a single whole.

[466] *Cœliac Branches* (Fig. 1315, p. 872).—Quain, in his account of the *gastric branches* of the pneumogastric nerve, remarks that a large portion of the right nerve passes to the solar, splenic, and left renal plexuses of the sympathetic; but he does not mention the *cœliac branches* more particularly, nor is this name used by Macalister. Von Langer and Toldt (*op. cit.*, p. 717) state that of the fibres of the *posterior œsophageal cord (right pneumogastric or vagus nerve—see note [464] above) a small part only passes in the form of *gastric branches* to the *posterior gastric plexus* (see note [465] above); "the greater part of the fibres of this cord pass as *cœliac branches* along the coronary artery of the stomach to the cœliac axis, where they join the semilunar ganglia."

[467] *Jugular Ganglion* (Fig. 1316, p. 873).—This name, here given to the *ganglion superius nervi glossopharyngei* of the Continental nomenclature, is by some English authors given to the *upper ganglion* or *ganglion of the root of the pneumogastric nerve*. (See note [447] above.) The jugular ganglion of the glossopharyngeal nerve is known also as *Ehrenritter's ganglion*.

[468] *Caroticotympanic Nerves* (Fig. 1317, p. 874).—Quain writes (*op. cit.*, vol. iii., part ii., p. 260): "The communicating branches (of the tympanic nerve) are, in addition to the small superficial petrosal nerve with its filament of union with the facial, one or two twigs (*caroticotympanic*) which pass downwards and forwards through the anterior wall of the tympanum to the carotid canal and join the sympathetic on the carotid artery, and the *small deep petrosal nerve* which runs forwards in a minute canal in the substance of the processus cochleariformis and enters the foramen lacerum, where it joins the carotid plexus of the sympathetic, or sometimes one of the large petrosal nerves."—If I am right in identifying the *nervus caroticotympanicus superior* with the *small deep petrosal nerve* of English authors (see note [452] above)—Von Langer and Toldt's description is not sufficiently minute to make this point quite clear—the *nervus caroticotympanicus inferior* should perhaps be called the *caroticotympanic nerve* without further qualification.

[469] **Jugular Nerve* (Fig. 1317, p. 874).—Quain describes this nerve, but uses only the name used on the Continent, *N. jugularis* (and that in a parenthesis merely). He writes: "Another branch [of the superior cervical ganglion], which is directed upwards from the ganglion, divides at the base of the skull into two filaments, one of which ends in the petrosal ganglion of the glossopharyngeal nerve; while the other, entering the jugular foramen, joins the ganglion of the root of the pneumogastric."—*Jugular nerve*, the English equivalent of the *nervus jugularis* of the official German nomenclature, is a name at once distinctive and appropriate, and may well be adopted.

[470] (Fig. 1317, p. 874).—The name *musculus hyopharyngeus* is used here by Toldt, but nowhere else in this work, to denote the *middle constrictor of the pharynx*. The parts of this muscle attached respectively to the great and the small cornu of the hyoid bone are, however, often known as the *ceratopharyngeus* and *chondropharyngeus* muscles. The *thyropharyngeus* muscle is the upper part of the inferior constrictor of the pharynx.—See Fig. 706, p. 433, in Part III., and note [1] to same page.

[471] **Cardiac Plexus* (Fig. 1321, p. 878).—English anatomists make a distinction, which is ignored by Toldt, between a *superficial* and a *deep cardiac plexus*. The *superficial cardiac plexus* lies in the concavity of the arch of the aorta, between the ligamentum arteriosum and the right pulmonary artery; it receives the left superior cardiac nerve (of the sympathetic system) and the lower cervical cardiac branch of the left pneumogastric nerve; it contains the *ganglion of Wrisberg* (see Fig. 1330, p. 887). The *deep cardiac plexus* lies behind the arch of the aorta, in front of the lower end of the trachea, and above the bifurcation of the pulmonary artery; much larger than the superficial cardiac plexus, it receives all the cardiac nerves with the exception of the two mentioned above.

[472] **Lowest Cardiac Nerve* (Fig. 1326, p. 884).—This nerve is not mentioned by Quain or by Macalister. It is described in the following terms by Von Langer and Toldt (*op. cit.*, p. 721): "The *nervus cardiacus imus* is the lowest of the cardiac nerves. It arises from the first thoracic ganglion, and, having joined the inferior cardiac nerve, passes to the cardiac plexus. When the inferior cervical ganglion and the first thoracic ganglion are conjoined, the lowest and the inferior cardiac nerves form a common trunk, which arises from the ganglion by two or by three roots."

[473] **Sinuvertebral Nerves* (Fig. 1329, p. 886).—Quain writes (*op. cit.*, vol. iii., part ii., p. 278): "Before dividing [into anterior and posterior primary divisions] each spinal nerve gives off a small *recurrent* or *meningeal branch*, which is joined by a filament from the communicating cord between the anterior division of the nerve and the sympathetic, and then runs inwards through the intervertebral foramen to the spinal canal, where it is distributed to the vertebræ and ligaments, the bloodvessels of the canal, and to the dura mater (Luschka, Rüdinger)." To the

intraspinal nerves formed in this manner by the union of the recurrent or meningeal branches of the spinal nerves with the sympathetic filaments from the rami communicantes, Toldt gives the name of *nervi sinuvertebrales*, a term used neither by Quain nor by Macalister.

[474] *Cœliac Plexus* (Fig. 1331, p. 888).—The term *plexus cœliacus* is used by the author in a comprehensive sense, equivalent to the *solar* or *epigastric plexus* of English writers. In England the term *cœliac plexus* is used to denote the anterior and upper part only of the solar plexus, which ensheathes the cœliac axis, and subdivides, with that vessel, into the *coronary*, *hepatic*, and *splenic plexuses*.

[475] *Smallest Splanchnic Nerve* (Ibid.).—The *renal branch of the small splanchnic nerve* is sometimes represented by a separate branch from the last thoracic ganglion to the renal plexus. This nerve was termed by Walter *nervus renalis posterior*, but is generally known in England as the *smallest splanchnic nerve*.

[476] *Vesical Nerves* (Fig. 1333, p. 890).—The nerves in Fig. 1333 to which the names of *superior* and *inferior vesical nerves* are given are the branches proceeding from the *vesical plexus* to the upper and lower hemispheres, respectively, of the urinary bladder. The *inferior vesical nerves* shown in Fig. 1272, p. 836, on the other hand, are branches of the fourth sacral nerve (*pudic plexus*, see note [438] above) destined for the bladder, for the most part by way of the vesical plexus of the sympathetic.

[477] *Hypogastric and Pelvic Plexuses* (Ibid.).—In the author's nomenclature the *plexus hypogastricus* is said to divide below into right and left portions, which still go by the name of *plexus hypogastricus*. In Quain's nomenclature the term *hypogastric plexus* denotes the upper median portion only of the *plexus hypogastricus* of Toldt, the paired lower portions being termed by Quain *right* and *left pelvic* or *inferior hypogastric plexuses*.

[478] *Perichoroidal Space and Lamina Suprachoroidea* (Fig. 1337, p. 893).—In describing the lymph space between the sclerotic and the choroid, neither Quain nor Macalister employs the name *spatium perichoroideale* or its English equivalent, *perichoroidal space*, but these names are used by other English authorities. In describing parts of the eye Latin names are most commonly used, *lamina suprachoroidea*, for example, rather than *suprachoroidal membrane*, etc.

[479] *Circular Ciliary Muscle* (Ibid.).—The *circular fibres* of the ciliary muscle, forming a ring round the insertion of the iris, make up the *circular ciliary muscle* of Müller, which is well developed in hypermetropic eyes, but atrophied, or even wanting, in myopic eyes.

[480] *Zonule of Zinn or Suspensory Ligament of the Lens* (Ibid.)—The zonule of Zinn extends from the ora serrata forwards and inwards over the ciliary body, and thence inwards to be attached to the capsule of the lens. The inner free portion only of this structure is strictly entitled to the name *suspensory ligament of the lens*, but as this ligament is the functionally important part of the zonule of Zinn, and as the term *suspensory ligament of the lens* finds no place in Toldt's nomenclature, I have in the text rendered the term *zonula ciliaris* (*Zinni*) as *zonule of Zinn or suspensory ligament of the lens*. The *fibræ zonulares* are the radiating meridional fibres of which the zonule is made up. "Between the fibres of the zonule are numerous interspaces, the *spatia zonularia* (*zonular spaces*), which communicate with the posterior chamber, and are therefore filled with aqueous humour. A closed canal, such as was formerly believed to exist in the substance of the suspensory ligament of the lens, encircling the equator of the lens, known as the *canal of Petit*, has, however, no real existence" (Von Langer and Toldt, *op. cit.*, p. 771).

[481] *Rima Cornealis* (Ibid.).—"The transition from the connective-tissue elements of the sclerotic into those of the cornea takes place along a sharply-defined circular zone in such a manner that the tissue of the sclerotic overlaps the margin of the corneal tissue, now in front, now behind, and thus the anterior margin of the sclerotic is, as it were, grooved to receive the corneal margin. This connection between the two structures receives the name of *rima cornealis*" (Von Langer and Toldt, *op. cit.*, p. 756). Both Quain (*op. cit.*, vol. iii., part iii., p. 17) and Macalister (*op. cit.*, p. 668) describe the connexion between the sclerotic and the cornea in similar terms, the latter writer saying, "In section the sclerotic seems to overlay the cornea, as the bezel overlaps the glass in a watch"; but neither of these authorities employs the name *rima cornealis*.

[482] **Annulus Ciliaris and* **Orbiculus Ciliaris* (Figs. 1338, 1339, p. 894).—These terms are not used by Quain, and I therefore quote definitions of their meaning from Von Langer and Toldt: "The *middle coat* of the eyeball, *tunica vasculosa oculi* . . . consists of two portions: a posterior and larger, the *choroid* (*coat*), and an anterior and smaller, the *iris*. The boundary-line between these two portions, which in position corresponds to the **rima cornealis* [see note [481] above], is indicated on the convex surface of the middle coat when the outer coat has been removed by the anterior margin of a prominent pale blue tinted ring, the **annulus ciliaris*. Along this boundary-line the middle and outer coats of the eye are more firmly connected with one another than is elsewhere the case" (*op. cit.*, p. 760). "The ciliary body is separated from the region of the ora serrata of the retina by a narrow ring-shaped zone of the choroid, usually somewhat darker in colour than the rest, known as the **orbiculus ciliaris*. We thus recognise three regions in the choroid: an anterior, the *ciliary body*, a middle, the **orbiculus ciliaris*, and a posterior (much larger than the others), the *smooth portion* of the choroid. These three portions are clearly differentiated one from another by the arrangement of their bloodvessels" (*op. cit.*, p. 760).

[483] *Plexus Gangliosus Ciliaris* (Fig. 1340, p. 894).—The *ciliary gangliated plexus* lies within the substance of the ciliary muscle. The ciliary nerves form two other gangliated plexuses in connexion with the middle coat of the eye, one on the outer surface of the choroid, and the other within the substance of the iris. See Quain, *op. cit.*, vol. iii., part iii., p. 35.

[484] **Ciliary Folds* (Figs. 1342, 1343, p. 895).—"In between the well-developed ciliary processes are small, slightly projecting eminences, having the same radial disposition as the processes. These are known as the *plicæ ciliares*" (Von Langer and Toldt, *op. cit.*, p. 760). These structures are not mentioned by Quain or Macalister.

[485] *Corona Ciliaris and Corpus Ciliare* (Figs. 1341 to 1343, p. 895).—"The ring of *ciliary processes* surrounding the iris constitutes as a whole the *corona ciliaris*. The anterior portion of the choroid (with the ciliary processes) constitutes what is known as the *ciliary body* (*corpus ciliare*)" (Von Langer and Toldt, *op. cit.*, p. 760).

[486] *Layers of the Choroid* (Fig. 1344, p. 895).—The choroid is bounded both externally and internally by non-vascular membranes. The external layer, similar to the lamina fusca of the sclerotic (from which it is separated by the perichoroidal lymph space) is known as the *suprachoroidal membrane* or *lamina suprachoroidea* (see note [478] above). The internal layer, adjacent to the pigmentary layer of the retina, structureless and transparent, is generally known in England as the *membrane of Bruch*; but sometimes, from its glassy appearance, as the *lamina vitrea* (in German, *Glashaut*); in the official German nomenclature it is termed the *lamina basalis*. Between the suprachoroidal mem-

brane and the membrane of Bruch is the richly vascular *choroid proper*, which itself consists of two strata—an *outer*, containing the larger bloodvessels, and an *inner*, containing the capillary ramifications. The outer, taking its name from the large venous plexuses in its substance, is known as the *vascular layer* or *lamina vasculosa*. The inner, capillary layer is generally spoken of both in England and Germany by the Latin name of *lamina* (or *tunica*) *choriocapillaris*, but is also known as the *tunica Ruyschiana*. Between the vascular layer and the choriocapillaris is an intermediate layer of connective tissue rich in elastic fibres and containing hardly any pigment; this layer, unimportant in man, is the tissue which in some mammals is so developed as to produce the appearance known as the *tapetum*.

[487] *Annuli Iridis, Minor et Major, and the Crypts and Contraction-Folds of the Iris* (Figs. 1346 to 1348, p. 896).—"In the anterior surface of the iris a peculiar moulding is to be distinguished, partly dependent on the arrangement of its bloodvessels. First of all, we note at a distance of about 1 millimetre ($\frac{1}{25}$ inch) from the pupillary margin of the iris, and parallel therewith, a somewhat sinuous little ridge, by which the iris is divided into two zones, the smaller of which, adjoining the pupil, is known as the *pupillary zone, annulus iridis minor*, while the larger, peripherally situate and extending outwards to the ciliary margin of the iris, is known as the *ciliary zone, annulus iridis major*. In the pupillary zone the anterior surface of the iris is beset with a number of small depressions (*crypts*), which are surrounded by delicate arborescent elevations. The ciliary zone is often somewhat lighter in tint, and displays on its anterior surface a series of from three to five furrows, concentrically surrounding the pupil, and between these furrows is a corresponding number of blunted tumuli (*contraction-folds*). In its peripheral marginal region the anterior surface of the iris is beset with numerous depressions, usually somewhat darkly coloured. Along the ciliary margin the superficial layers of the stroma of the iris are more loosely woven than elsewhere, so that delicate trabeculæ are formed, connecting the edge of the iris with the rather ragged edge of the posterior elastic lamina of the cornea. The circle of these trabeculæ, in the angle between the cornea and the iris, constitutes the so-called *ligamentum pectinatum iridis*, which itself forms the inner wall of the *canal of Schlemm*" (Von Langer and Toldt, *op. cit.*, pp. 760, 761). The vascular rings within the substance of the iris, *circulus minor* and *circulus major*, are described by Quain, but the division of the iris into an *annulus minor* or *pupillary zone* and *annulus major* or *ciliary zone*, dependent on these vascular arrangements, is not mentioned by the English author, nor does he describe the *crypts* and the *contraction-folds* of the iris. The last-named, however, are alluded to by Macalister.

[488] *Pigmentary Layer of the Iris* (Figs. 1346, 1348, 1349, p. 896).—This term is a literal translation of the *stratum pigmenti iridis* of the official German nomenclature. The pigmentary layer of the iris is also variously known, according to the point of view, as the *pars retinalis iridis, pars iridica retinæ*, and *uveal pigment of the iris*. Regarding the *free border of the pigmentary layer* (see Fig. 1346), Quain writes (*op. cit.*, vol. iii., part iii., p. 31), "The pigmentary layer . . . ends abruptly at the margin of the pupil," but Macalister remarks (*op. cit.*, p. 671), "The pigment usually extends into the pupillary zone, defining its border."

[489] *Venulæ Maculares, Superior et Inferior* (Fig. 1355, p. 898).—The little veins running horizontally outwards from the optic papilla to the yellow spot are thus named by Toldt. Quain does not use the term *macular venules*, saying merely, "The macula is also supplied by small vessels which pass directly to it from the papilla" (*op. cit.*, vol. iii., part iii., p. 55). The *arteriæ maculares, superior* and *inferior*, are, however, mentioned by name by Macalister.

[490] *Two Principal Groups of the Layers of the Retina* (Fig. 1356, p. 899).—The layers of the retina are divided by Toldt into two principal groups—an inner, which he calls the *Gehirnschichte*, and an outer, the *Nervenepithelschichte*. Macalister, who recognises this grouping, speaks of these primary layers as *nerve elements* (or *layers*) and *neuro-epithelial elements* (or *layers*); but the German *Gehirnschichte* must be literally rendered *brain layers*. (These terms are not used by Quain.) The layers making up these two groups are enumerated in the text of Fig. 1356.

[491] *Rod Cell and Cone Cell* (Ibid.).—These terms are translations of the German words *Stäbchensehzelle* and *Zapfensehzelle*, used in the original German edition of this work. They denote what Quain calls *rod element* and *cone element*, respectively, but the terms used in the text are more clearly expressive of the views of Toldt, as embodied in the following passage (Von Langer and Toldt, *op. cit.*, p. 767): "The granules (*Körner*) of the outer nuclear layer combine with the rods (*Stäbchen*) and cones (*Zapfen*) to form the neuro-epithelium (*Sinnesepithel*) which lies outside the brain layer of the retina." The *rods* and *cones*, and their connexion with the granules of the outer nuclear layer, are then described, and the author proceeds: "The external granules are, in truth, nothing more than the nuclei of long-drawn-out cells, whose peripheral processes form the rods and cones. These cells are a particular kind of sensory cells, known as visual cells (*Sehzellen*), which unite to form the sensory epithelium (neuro-epithelium) of the retina. A visual cell, therefore, is a greatly elongated cell, the nucleus of which (outer granule) lies in the extended middle portion of the cell, whose peripheral end bears a rod or a cone, and whose central end terminates in an arborescence in the outer molecular layer." These views should be compared with those of Quain, *op. cit.*, vol. iii., part iii., p. 46 (small print at top of page) and pp. 56 and 57 (section on the "Interconnexion of the Retinal Elements"). With Fig. 1356 Quain's Figs. 52 and 65 (*op. cit., tom. cit.*) should also be compared.

[492] *Tarsi* (Fig. 1367, p. 902).—Macalister speaks of these as the *tarsal bodies*. They were formerly often called the *tarsal cartilages*, but this was a misnomer, as they consist purely of fibrous tissue, without any intermixture of cartilage cells.

[493] **Annulus Conjunctivæ* (Fig. 1368, p. 902).—"We distinguish the *palpebral conjunctiva, conjunctiva palpebrarum*, from the *ocular conjunctiva, conjunctiva bulbi*; the latter extends forwards to the corneal margin, where it is intimately connected with the anterior border of the sclerotic; this adherent and somewhat thin portion of the ocular conjunctiva is known as the *annulus conjunctivæ*. Immediately within the annulus the conjunctival epithelium is continued, without any definite boundary, into the corneal epithelium" (Von Langer and Toldt, *op. cit.*, p. 781). The term **annulus conjunctivæ* is not used by Quain.

[494] *Bursa Trochlearis* (Fig. 1370, p. 903).—According to Quain (*op. cit.*, vol. ii., part ii., p. 290), "the pulley is lined by a synovial sheath"; but Macalister writes (*op. cit.*, p. 653), "The tendon is here [*i.e.*, within the pulley] invested by a very lax laminated areolar tissue with an imperfect endothelial lining in its clefts, but there is scarcely ever a true synovial membrane lining the trochlea."

[495] *Fascial Sheaths of the Muscles of the Eyeball* (Ibid.).—"All the muscles of the eyeball are covered, as well on their bulbar as on their orbital surfaces, by fascial investments, *fasciæ musculares*. In the posterior part of the orbit these are thin and delicate, but they become much thicker and stronger as the

muscles approach the globe. Here they are on the one hand connected with Tenon's capsule (*fascia bulbi*), and on the other are connected by firm fibrous slips (*Fascienzipfel*) with the margin of the orbit, and more especially with the trochlea. In this manner a fixed relation is maintained between the globe and the walls of the orbit. At their thinned anterior extremities the fascial sheaths of the muscles radiate along the fornix conjunctivæ, where they become interwoven with the conjunctival submucous areolar tissue" (Von Langer and Toldt. *op. cit.*, p. 775). These fascial sheaths are usually regarded as being derived from the posterior (orbital or outer) layer of the capsule of Tenon as the muscles perforate that layer on their way to the eyeball, and are generally described in connexion with the description of Tenon's capsule. See Quain, *op. cit.*, vol. ii., part ii., p. 292; and Macalister, *op. cit.*, p. 652. Further, in vol. iii., part iii., pp. 11, 12, Quain writes: "The capsule of Tenon is strengthened just behind the places where the recti muscles perforate it by bands of fibrous tissue, and it is attached on either side to the malar and lachrymal bones by elastic ligamentous structures which also receive fibrous slips from the external and internal recti. These structures serve as check ligaments to these muscles. They are stated by Sappey to contain plain muscular fibres. Fibrous slips also pass from the sheaths of the superior and inferior rectus, and are attached to the conjunctiva palpebrarum and to the connective tissue of the eyelid." Thus, the structures to which Toldt gives the name of *Fascienzipfel* may be called in English *fibrous slips of the fascial sheaths* of the respective muscles, or, more concisely, *check ligaments*.

[496] *Sulci in the Neighbourhood of the Eye* (Figs. 1380, 1381, p 908).—"That portion of the eyelid through which the tarsus or tarsal body [see note [492] above] extends is usually distinguished as the *tarsal portion* (*pars tarsalis*); that portion of the eyelid which lies nearer to the orbital margin (upper or lower, as the case may be), whose groundwork is formed merely by the thin palpebral fascia (septum orbitale), is distinguished as the *orbital portion* (*pars orbitalis*). The former portion, on account of its firm consistency, always remains smooth; whilst the latter portion, when the eye is open, falls into a fold, which disappears when the eye is closed; the boundary between the two portions of the eyelid is, however, indicated by a permanent furrow in the skin, the *sulcus orbitopalpebralis*" (Von Langer and Toldt, *op. cit.*, p. 779). These **orbitopalpebral sulci* are mentioned neither by Quain nor by Macalister. Quain writes (*op. cit.*, Appendix, p. 14): "When the eye is open the skin is drawn into the deep *superior palpebral sulcus* immediately above the upper lid, and forms a loose projecting fold between this furrow and the eyebrow. The corresponding *inferior palpebral sulcus* of the lower lid is much slighter and often broken up; it is most distinct when the eye is directed downwards." Quain's *superior* and *inferior palpebral sulci* must not be identified with the *orbitopalpebral sulci* of Toldt, the latter being merely the slight cutaneous grooves corresponding respectively to the upper margin of the upper tarsal body and the lower margin of the lower tarsal body. Quain proceeds (*op. cit., loc. cit.*): "Another shallow groove, the *palpebromalar sulcus*, runs round from near the inner canthus of the eye, following fairly closely the lower margin of the orbit. A small *external palpebral sulcus* is continued outwards from the outer canthus for about 3 millimetres, and forms a prolongation of the palpebral cleft when the eye is closed." Macalister writes (*op. cit.*, p. 521): "Near the lower border of the upper lid is a *superior marginal sulcus* parallel to the free border." This is not indicated in Toldt's figures. "The lower lid," writes Macalister (*op. cit.*, p. 522), "is in some eyes marked by an *inframarginal fold* [*? furrow*]. It is usually marked off from the infra-orbital region by an *infrapalpebral sulcus;* but this is inconstant, as the motion of the lower lid in opening the eye is slight. . . . Below the infrapalpebral sulcus is a variable *palpebromalar sulcus* which deepens and often becomes a characteristic marking in old age, or in wasting diseases, which gives to the eye the appearance described as *hollow*." The *infrapalpebral sulcus* of Macalister is identical with the *inferior palpebral sulcus* of Quain; Toldt calls it *sulcus infrapalpebralis*, and shows it in Figs. 1380, 1381, p. 908.

[497] *Rictus Oculi or Rima Palpebrarum* (Fig. 1380, p. 908).—The term *rictus oculi* is used by Macalister to denote the cleft between the lids, through which, when the eye is open, the front of the globe is visible. In the official German nomenclature this cleft is called *rima palpebrarum*. Neither term is to be found in Quain's "Anatomy," though both are current in England. Quain speaks of the *palpebral cleft*.

[498] *Commissures of the Eyelids* (Figs. 1380 to 1382, p. 908).—Neither Quain nor Macalister makes use of the term *commissure* in this connexion. The fact is that the term *canthus*, which I have employed to represent in the English nomenclature the *angulus oculi* of the official German nomenclature, has really a somewhat wider significance than the latter, and includes that of *commissura palpebrarum*. Thus, English ophthalmic surgeons speak of "dividing the outer canthus to relieve tension"; and in that case, obviously, the *commissura palpebrarum lateralis* of the Germans is denoted. The term *canthus*, indeed, which originally signified the tire of a wheel, is somewhat misapplied when used, as it habitually is in England, to denote the angles of the palpebral cleft.

[499] **Intermarginal Sulcus* (Fig. 1382, p. 908).—This term is not found in Von Langer and Toldt's "Anatomy," but is evidently applied here to the flattened, rather than grooved, free margin of the lid, between the outer limbus and the inner. See also note [502] below.

[500] *Pinguecula* (Ibid.). —"A yellowish spot, looking like adipose tissue, in the conjunctiva, close to the inner or outer edge of the cornea, consists of thickened conjunctiva and subconjunctival tissue, and contains no fat. It is commonest in old people and in those whose eyes are exposed to local irritants. Though of no consequence, advice is often asked about it" (Nettleship, "Diseases of the Eye," 6th ed., p. 281).

[501] *Riolan's Muscle* (Fig. 1383, p. 909).—"The *deep part* of the *palpebral portion* of the *orbicularis palpebrarum muscle*, known as the *pars lachrymalis* or *Horner's muscle* . . . springs from the lachrymal crest and from the process of the internal tarsal or palpebral ligament which is attached to that crest. . . . In the lid itself this *deep portion* lies behind the follicles of the eyelashes . . . to this marginal portion of the muscle the name of *musculus ciliaris Riolani* or *musculus subtarsalis* is also given" (Von Langer and Toldt, *op. cit.*, p. 780). Quain writes (*op. cit.*, vol. iii., part iii., p. 2): "A marginal fasciculus (of the orbicularis muscle) lies within the line of the eyelashes, separated by the bulbs of the lashes from the other fibres, and constituting the *ciliary bundle* or *muscle of Riolan*." The fibres of the *tensor tarsi* or *muscle of Horner*, passing outwards behind the lachrymal sac from the origin above given, are, according to Quain's description, inserted into the ciliary bundles. The name *subtarsal muscle* is used by Macalister.

[502] **Rivus Lachrymalis* (Ibid.).—This term is used neither by Quain nor by Macalister, nor is any definition of it to be found in Von Langer and Toldt's "Anatomy." In the original German edition of this work the alternative name of *Thränenbach, lachrymal*

channel, is given. It denotes, I presume, the channel for the lachrymal secretion which, when the lids are closed, is formed by the apposition of the upper and lower **intermarginal sulci*. See note [499] above.

[503] *Lanugo* (Fig. 1386, p. 910).—The use of this term is in England usually restricted to denote the downy crop of hairs with which an infant is covered at birth, but which are all shed within a few months thereafter. In Germany, on the other hand, *Wollhaare* or *Lanugo* denotes the rudimentary hairy covering of the body throughout life, as distinguished from the specialized and fully developed hairs of the head, beard, axillæ, etc. There is no term current in England to distinguish this rudimentary hairy covering.

[504] *Superior Palpebral Muscle, or Musculus Tarsalis* (Ibid.).—"Just beneath the conjunctiva, both in the upper and in the lower lid, there is a layer of smooth muscle fibres which are attached by means of thin elastic tendons to the margins of the tarsal bodies, and probably serve to keep the eye open. They are known as *musculus tarsalis superior* and *musculus tarsalis inferior*" (Von Langer and Toldt, *op. cit.*, pp. 780, 781). To the upper of these Macalister gives the name of *superior palpebral muscle*. Quain describes them, stating that the upper arises from the under surface of the aponeurotic expansion of the levator palpebræ superioris, the lower from the neighbourhood of the inferior oblique muscles, but he leaves the structures unnamed. They are among the fibres denoted by the name of *Müller's muscle*, a term liable to lead to confusion. See note [451] above.

[505] *Lachrymal Gland* (Figs. 1388, 1389, p. 911).—The *lachrymal gland* was till recently described, and is by many anatomists still described, as a single gland. The fore part of the gland, however, is separated from the rest by a thin fascial layer; it lies immediately beneath the conjunctiva, being in contact with the outer part of the superior fornix; to this part the name of *inferior lachrymal gland* is sometimes given, the remaining and larger portion being then known as the *superior lachrymal gland*. The *inferior lachrymal gland* is also known as the *palpebral portion of the lachrymal gland*, and as the *accessory lachrymal gland* (*of Rosenmüller*).

[506] *Common Orifice of the Lachrymal Canaliculi* (Fig. 1392, p. 913).—"The canals either unite near their ends, or they open separately, but close together, into a diverticulum of the nasal sac which is known as the *sinus of Maier*" (Quain, *op. cit.*, vol. iii., part iii., p. 9). "The two [canaliculi] unite internal to the caruncula to form usually a very short tube or small sac, the *vestibulum*, which opens internally into the lachrymal sac, of which, indeed, it is only a lateral pouch" (Macalister, *op. cit.*, p. 645).

[507] *Choroidal Fissure.*—The term *coloboma*, used by Toldt to denote the *choroidal fissure* (the cleft through which, in the developing eye, the mesoblast passes into the space between the lens invagination and the pigment layer of the optic cup), is in England usually employed to denote a congenital cleft in the iris, or choroid, or both, due to imperfect closure of the choroidal fissure.

[508] *Subdivisions of the Concha* (Figs. 1406, 1408, p. 920).—The anterior part of the helix descends towards the external auditory meatus, but, before reaching it, curves backwards across the cavity known as the *concha*, which is thus divided by the *crus of the helix* into two parts—an upper, **cymba conchæ*, and a lower, **cavum conchæ*. These terms are not used by Quain or Macalister.

[509] *Fossa of the Antihelix* (Figs. 1406, 1407, p. 920).—In England this name is usually applied to a depression on the outer surface of the auricle (see Fig. 1406). In Germany, however, this depression is known as the *fossa triangularis*, while by the *fossa anthelicis* is meant the depression on the inner surface of the auricle, below the *eminentia scaphæ* (see Fig. 1407).

[510] *Auricularis Anterior or Attrahens Auriculam Muscle* (Figs. 1412, 1413, p. 921).—It is usually stated that the superficial temporal vessels and nerve lie *beneath* this muscle. Von Langer and Toldt, however, describe the muscle as consisting of two layers, a *superficial* and a *deep*; and, according to Quain (*op. cit.*, vol. ii., part ii., p. 281), "Cruveilhier describes as normal a deep anterior auricular muscle, passing from the zygomatic process to the outer surface of the tragus." As Fig. 1412 shows, the superficial temporal vessels and nerves are *superficial* to this deep layer of the muscle.

[511] **Cupular Portion of the Epitympanic Recess* (Fig. 1414, p. 922).—In the original German edition of this work this region of the tympanum is named *Gipfelbucht*—the word signifies literally "recess of the summit"—a term not to be found in Von Langer and Toldt's "Anatomy," nor even in the "German-English Dictionary of Medical Terms" by Treves and Lang. In the former work, however, the following passage occurs on pp. 788, 789: "At the boundary between its upper and outer walls the epitympanic recess deepens to form a hemispherical fossa, which is known as the *pars cupularis recessus epitympanici*"; and on p. 805, "The head of the hammer-bone is attached by means of the superior ligament of the malleus to the cupular portion of the epitympanic recess." Bearing these facts in mind, an examination of Fig. 1423, p. 925, in which the term *Gipfelbucht* is again used, will render it evident that the latter must be identified with the *cupular portion of the epitympanic recess*. The term *epitympanic recess* or *aditus ad antrum* is used by Quain, but this author does not speak of the **cupular portion* of the recess. Fig. 1423 shows well the manner in which the recess, in Quain's words, "overhangs the inner end of the external auditory meatus." Why the term *Gipfelbucht* is used in this volume, in contradistinction to the Latin term *pars cupularis recessus epitympanici* in Part I. of this Atlas (see Fig. 132, p. 64) and in Von Langer and Toldt's "Anatomy," is not apparent.

[512] (Figs. 1420, 1422, p. 924.) Toldt distinguishes between the *pars tensa* and the *pars flaccida membranæ tympani*. The latter is usually known in England as the *membrana flaccida*. The term *pars tensa membranæ tympani* is not used by Quain or Macalister; I have rendered it literally *tense portion of the tympanic membrane*.

[513] **Malleolar Prominence and *Stria Malleolaris* (Fig. 1420, p. 924).—"Near the upper margin of the membrana tympani we see also a small prominence, *prominentia malleolaris*, caused by the short process (*processus brevis vel obtusus*) of the malleus" (Von Langer and Toldt, *op. cit.*, p. 803). This term is not used by Quain or Macalister; nor does either of these authors employ the term *stria malleolaris* to denote the handle of the malleus seen through the membrana tympani.

[514] **Anterior and Posterior Malleolar Folds* (Fig. 1421, p. 924).—"The auditory ossicles are imbedded in mesentery-like folds of the mucous membrane, which, as they have free projecting borders, give rise to pouches or recesses. One of these folds is attached in front and behind to the margin of the membrana tympani, contains between its layers the root of the long process of the malleus and the chorda tympani nerve, and extends running parallel to the membrana tympani, on to the upper portion of the handle of the malleus, which divides it into a larger anterior and a smaller posterior portion; we speak, therefore, of its two parts as the *plica malleolaris anterior* and the *plica malleolaris posterior*. These folds, with the tympanic

membrane, bound two pouches, each of which has a slit-shaped, downwardly directed orifice; they are known as the *recessus membranæ tympani, anterior et posterior*" (Von Langer and Toldt, *op. cit.*, p. 806). This fold is described by Quain (*op. cit.*, vol. iii., part iii., p. 96) as forming the inner boundary of the *anterior* and *posterior pouches of the tympanum;* but the names **anterior* and **posterior malleolar folds* are not used by this author. They must not be confused with the *tympanomalleolar folds* shown in Figs. 1420 and 1422.

[515] **Fold of the Incus* (Fig. 1423, p. 925).—"A second, likewise vertically disposed, fold of the tympanic mucous membrane, the *plica incudis*, is attached to the posterior wall of the tympanum, and forms the covering of the incus, from the long process of which it descends. A third, horizontal fold, the *plica stapedis*, runs from the pyramid or eminentia papillaris along the tendon of the stapedius muscle, and covers not only the crura, but also the obturator membrane of the stapes" (Von Langer and Toldt, *op. cit.*, p. 806: this quotation is a continuation of that in note [514] above). The terms **fold of the incus* and **fold of the stapes* are used neither by Quain nor by Macalister. The former is shown in Fig. 1423, p. 925, and in Figs. 1429 and 1431, p. 926; but the latter is not indicated by name in this Atlas.

[516] *Processus Orbicularis* seu *Lenticularis* (Figs. 1423, 1425, 1427, p. 925).—"This tubercle, which articulates with the head of the stapes, was formerly, under the name of *os orbiculare* seu *lenticulare*, described as a separate bone, which, indeed, it originally is in the fœtus up to the sixth month" (Quain, *op. cit.*, vol. iii., part iii., pp. 90, 91). The old name of *os lenticulare* is used by Macalister. In the official German nomenclature the process is termed *processus lenticularis*.

[517] (Fig. 1423, p. 925.) The term *membrana propria*, used by Macalister to denote the *central fibrous layer* of the membrana tympani, is more appropriate than the term *tunica propria*, used by Quain, since *tunic* properly means a *covering*, and this is the central portion of the membrane, itself covered by an outer cutaneous and an inner mucous tunic.

[518] *Crura of the Stapes* (Fig. 1426, p. 925).—The *anterior* crus of the stapes is the straighter of the two, and is therefore named by Macalister *crus rectilineum;* the *posterior*, more curved of the two crura being by this author named *crus curvilineum*. The crura diverge from a constricted part, close to the head, known in England as the *neck* of the bone; the crura and the neck combine to form what is sometimes named the *arch* of the stapes. Neither of these latter terms is represented in the nomenclature used by Toldt.

[519] *Obturator Membrane of the Stapes* (Ibid.).—This membrane is described by Quain, but the name *obturator membrane* is not used by this author. Macalister speaks of it in one place as the *obturator membrane*, and in another as the *membrana obturatoria*.

[520] *Posterior Ligament of the Incus* (Fig. 1429, p. 926).—This being the only ligament of any importance attached to the incus, Quain calls it the *ligament of the incus* without qualification. Macalister uses the Latin name, *ligamentum incudis posterius*.

[521] *Petrosphenoidal Suture* (Ibid.).—In the first (osteological) section of this work the articulation between the anterior border of the petrous bone and the great wing of the sphenoid bone is called by Toldt *fissura sphenopetrosa*, a term which in Fig. 104, p. 48, I have translated *petrosphenoidal fissure*, and in Fig. 105, p. 49, *petrosphenoidal suture*. In the former case, seen from below, it has rather the appearance of a *fissure;* in the latter, seen from above, of a *suture*. The latter also is the aspect presented in Fig. 1429, p. 926. It is, in fact, only over a small area that the apposed surfaces of the two bones are in actual contact so as to form a *suture;* elsewhere these surfaces, and this for the greater part of their extent, form the sides of a *fissure*. *Petrosphenoidal fissure* is the name given to the articulation by Quain.

[522] *Roof of the Tympanum and Tegmen Tympani* (Ibid.).—Macalister uses these terms as interchangeable; according to Quain, however, the thin plate of bone known as *tegmen tympani* "also roofs over the canal of the Eustachian tube and the tensor tympani muscle" (Quain, *op. cit.*, vol. iii., part iii., p. 81). Thus, the *roof of the tympanum* forms a part only of the *tegmen tympani*. The former is distinguished by Toldt as the *paries tegmentalis cavi tympani* (*cf.* Fig. 133, p. 65, in Part I. of this Atlas).

[523] *Secondary Tympanic Membrane* (Fig. 1431, p. 926).—Quain calls this structure the *secondary membrane of the tympanum*. The form used in the text seems preferable; and it is, moreover, a literal translation of the term *membrana tympani secundaria*, used in the official German nomenclature. Better than any of these, because more precise, is, in my opinion, the name used by Foster and some other authorities, *membrane of the fenestra rotunda*. This harmonizes, moreover, with the alternative name of the *annular ligament of the base of the stapes* (see note [7], p. 926).

[524] *Cochleariform Process* (Fig. 1432, p. 927).—It should be noted that Quain designates by this term the entire **septum of the musculotubal canal* (see note [528] below), which separates the osseous portion of the Eustachian tube from the canal for the tensor tympani muscle. By Toldt this septum is named *septum canalis musculotubarii;* while by the term *processus cochleariformis* the German author denotes merely the expanded and everted end of the septum, which projects into the tympanic cavity and separates the fenestra ovalis from the tympanic orifice of the Eustachian tube. The tendon of the tensor tympani muscle bends at nearly a right angle over the cochleariform process as over a pulley. Toldt's usage of the term *processus cochleariformis* is preferable to Quain's, and is, indeed, that of many English anatomists (see also Fig. 135, p. 66, in Part I.).

[525] *Groove of the Promontory* (Ibid.).—According to Quain, "the surface of the promontory is marked by grooves, in which lie the nerves of the tympanic plexus" (*op. cit.*, vol. iii., part iii., p. 83). Toldt, on the other hand, speaks of a single, vertical groove, *sulcus promontorii*, "a continuation of the tympanic canaliculus; in this groove the tympanic nerve (nerve of Jacobson) and the small superficial petrosal nerve meet and unite" (Von Langer and Toldt, *op. cit.*, p. 788). In Fig. 138, p. 67, Part I. of this Atlas, however, the surface of the promontory exhibits several grooves, as described by Quain.

[526] (Fig. 1435, p. 928.) The *Eustachian cartilage* is bent in such a manner that it forms the roof, the greater part of the inner wall, and a small part of the outer wall of the cartilaginous portion of the Eustachian tube. The portion forming the inner wall is named by Toldt *lamina medialis* (**inner plate*), that forming the upper part of the outer wall *lamina lateralis* (**outer plate*), of the Eustachian cartilage. Where the cartilage is lacking, the wall of the cartilaginous portion of the tube is strengthened by a strong but flexible fibrous membrane, named by Toldt *lamina membranacea tubæ auditivæ*. By Quain this membrane is called *fascia salpingopharyngea*, a name used on the Continent in a different signification (see note [1] to p. 436, in Part IV.), and therefore better avoided in this connexion. I have called it simply the *membranous portion of the Eustachian tube*. The parts just described are best seen in a transverse section of the Eustachian tube, as in Figs. 1437, 1438, and 1439, p. 929.

[527] *Levator Cushion* (Ibid.).—"When the levatores palati are contracted, the upper surface of the soft palate presents a convex

eminence behind each posterior naris, called the *ievator cushion.* This is occasionally seen in the dead body" (Quain, *op. cit.*, vol. iii., part iv., p. 57).

[528] **Musculotubal Canal* (Fig. 1436, p. 929).—The name **canalis musculotubarius* is used by the author as a common name for the *canal for the tensor tympani muscle* and the *osseous canal for the Eustachian tube* (which canals are therefore called by him *semicanals*, viz., *semicanalis musculi tensoris tympani* and *semicanalis tubæ auditivæ*, respectively), which are separated one from the other more or less completely by the **septum of the musculotubal canal* (**septum canalis musculotubarii*) or *cochleariform process.* The latter name, however, is better confined to the expanded and everted end of the septum, which projects freely into the tympanic cavity. See note [524] above.

[529] *Crura of the Semicircular Canals* (Fig. 1442, p. 930).—In the German official nomenclature that half or limb of each semicircular canal whose extremity dilates into an ampulla is termed the *ampullary crus* (*crus ampullare*), whilst the other half or limb of the canal is termed the *simple crus* (*crus simplex*). Further, the non-ampullary or undilated extremities of the superior and posterior semicircular canals unite before opening into the vestibule to form what is termed the *common crus* (*crus commune*). (See Von Langer and Toldt, *op. cit.*, p. 792.) These terms are sometimes used in England also.

[530] *Whorls of the Cochlea* (Figs. 1440, 1441, p. 930).—The term *whorl* is employed by Macalister and by Foster, and is probably that most generally used in speaking of the convolutions of the cochlea; by Quain, however, the terms *coil* and *turn* are employed indifferently.

[531] *Macula Cribrosa Superior* (Fig. 1442, p. 930).—This term is used by Macalister, but not by Quain. It denotes the cribriform area at the upper end of the crest of the vestibule, the foramina of which correspond with those of the *area cribrosa superior* (*area vestibularis superior*, according to Toldt) of the fundus of the internal auditory meatus or reniform fossa (see Fig. 140, p. 68, in Part I. of this Atlas), and transmit the filaments of the superior division of the auditory nerve, or vestibular nerve, which supplies the utricle and the ampullæ of the superior and external semicircular canals.

[532] *Macula Cribrosa Media* (Ibid.).—This term is used by Macalister, but not by Quain. It denotes the cribriform area in the lower part of the fovea hemispherica, the foramina of which correspond with those of the *area cribrosa media* (*area vestibularis inferior*, according to Toldt) of the fundus of the internal auditory meatus or reniform fossa (see Fig. 140, p. 68, in Part I. of this Atlas), and transmit the filaments of the nerve to the saccule.

[533] *Macula Cribrosa Inferior* (Ibid.).—This term is used by Macalister, but not by Quain. The smallest of the three cribriform areas of the vestibule, it is situate close to the ampullary orifice of the posterior semicircular canal. Its foramina lead to the *foramen singulare* of the fundus of the internal auditory meatus or reniform fossa (see Fig. 140, p. 68, in Part I. of this Atlas), and transmit the filaments of the posterior ampullary nerve.

[534] **Area of the Cochlea* (Fig. 1448, p. 932).—"Much the greater part of the lower division [*inferior fossa*, Quain] of the fundus of the internal auditory meatus [*i.e.*, of the region below the *transverse crest* or *crista falciformis*] is occupied by the *area cochleæ;* this depressed area corresponds to the base of the cochlea, and is occupied by the *tractus spiralis foraminosus*" (Von Langer and Toldt, *op. cit.*, p. 795). "In the inferior fossa are seen (1) the *area cribrosa media* . . .; (2) the *foramen singulare* . . .; and (3) the *tractus spiralis foraminulentus*, for the cochlear division of the auditory nerve, a series of minute holes beginning below the area cribrosa media, forming one turn and a half in a depression corresponding to the base of the cochlea, and ending at the *foramen centrale cochleæ*, the orifice of the central canal of the modiolus" (Quain, *op. cit.*, vol. ii., part i., p. 43). Quain appears to use the term *tractus spiralis foraminulentus* in a double sense, but it seems better to limit its signification to the spirally arranged series of foramina, and to adopt the name *area of the cochlea* for the whole area corresponding to the base of the cochlea. See also Fig. 140, p. 68, in Part I.

[535] *Spiral Septum separating the Whorls of the Cochlea* (Fig. 1452, p. 934).—By a strange oversight the *complete* osseous septum between the whorls of the cochlea, upon which the separation of the cavity of that organ into a coiled tube depends, has been left unnamed by Quain and also by Macalister. Nor is there any term for it in the official Latin nomenclature of the German Anatomical Society. Toldt calls it the *Zwischenwand* (*partition-wall*), a name which is insufficiently distinctive. The name used in the text of Figs. 1451 and 1452, p. 934, *spiral septum separating the whorls of the cochlea*, is cumbrous; but to speak of it as the *spiral septum* alone might lead to confusion with the *incomplete* septum known as the *osseous spiral lamina.*

[536] *Spiral Osseous Canal of the Cochlea* (Fig. 1451, p. 934).—The term *spiral osseous canal* is used by Quain to denote the cavity of the cochlea when the membranes have been removed. To speak simply of the *spiral canal of the cochlea* (a literal translation of the term *canalis spiralis cochleæ* used by Toldt) might lead to confusion with the *spiral canal* of the intact cochlea situate between the *scala vestibuli* and the *scala tympani.* This canal was formerly known as the *scala media*, but is now usually termed the *canal of the cochlea* or *canalis cochleæ;* it is also known as the *canalis membranaceus cochleæ*, and as the *ductus cochlearis.* This last name, *ductus cochlearis*, being the one always used in Germany to denote the *cochlear canal* of English authors, no confusion is liable to arise in that country with the *canalis spiralis cochleæ.*

[537] **Lamina Modioli* (Figs. 1451, 1452, p. 934).—This term is not used by Quain or Macalister, and I therefore quote the following definition from Von Langer and Toldt (*op. cit.*, p. 793): "An independent axis exists within the windings of the cochlea just as little as within those of a snail-shell. If, however, we break into the spiral tube of a snail-shell from without, we find that those parts of the wall of the tube adjacent to the geometrical axis of the coil combine to form an apparent columnar axis. It is the pseud-axis of the cochlea formed in this manner that is known as the *modiolus.* In the two complete whorls the circumference of this axis is likewise complete, so that it forms a small hollow column, with an aperture in the centre of the base of the cochlea; in the apical whorl, however, which is a half-turn merely, the circumference of the axis is incomplete, and has the form of a ledge projecting from the wall, which ascends perpendicularly [see note [540] below] to the cupola, and is known as the **lamina modioli.*"

[538] **Area of the Facial Nerve* (Fig. 1453, p. 934).—In note [534] above, dealing with the terminology of the parts of the fundus of the internal auditory meatus or reniform fossa, the division of this region into a smaller *superior fossa* and a larger *inferior fossa* by means of a horizontal ridge known as the *transverse crest* or *crista falciformis* was described. In the bottom of the superior fossa is the *area cribrosa superior* (*area vestibularis superior*, according to Toldt), transmitting the filaments of the superior division of the auditory nerve, or vestibular nerve; while on the anterior wall of the fossa is the orifice of the aqueduct of

Fallopius. This latter, in the German official nomenclature, is known as the *area nervi facialis*.

[539] *Longitudinal Canals of the Modiolus* (Ibid.).—This term, denoting the finer canals of the axis of the cochlea—all the canals, that is to say, besides the *central canal* and the *spiral canal of the modiolus*—is not used by Quain. The structures in question are, however, described by this author in the following terms (*op. cit.*, vol. iii., part iii., pp. 102, 103): "The central part of the modiolus is spongy as far as the last half-coil, and is pierced by many small canals, for the passage of the nerves and vessels to the spiral lamina; one of these canals, larger than the rest, *central canal of the modiolus*, runs from the base through the centre of the modiolus. The base of the modiolus appears in the internal auditory meatus as the fossula cochleæ containing the foramen centrale and the tractus spiralis foraminulentus; the latter transmitting the nerve fibres of one and a half turns of the cochlear tube, the former being continued into the central canal of the modiolus and transmitting the nerve fibres for the uppermost turn." The *fossula cochleæ* thus briefly alluded to by Quain is the portion of the fundus of the internal auditory meatus or reniform fossa called by Toldt *area cochleæ* (see note [534] above). In Fig. 114, p. 103 (*op. cit.*, *tom. cit.*), Quain calls it, not *fossula*, but *fovea cochleæ*. It must not be confounded with the *recessus cochlearis*, a minute depression on the inferior wall of the vestibule in which the blind basal extremity of the ductus cochlearis or canal of the cochlea is lodged (see Fig. 1442, p. 930).

[540] *Conventional Description of the Cochlea* (Ibid.).—In note [537] above, the *lamina modioli* is said to ascend *perpendicularly* to the cupola of the cochlea. It can be said to do so only if the axis of the cochlea is considered as vertical, for descriptive purposes. "In the natural position," says Foster ("Physiology," 5th ed., 1891, p. 1340), "the cochlea is nearly horizontal with the beginning of the first whorl in the base abutting on the median wall of the tympanum, and with the apex directed forwards and towards the median line; but when we are dealing with it by itself it will be convenient to consider it as if it were vertical in position, with the apex above and the base below." Quain acts on the same convention in his description of the isolated cochlea (*op. cit.*, vol. iii., part iii., p. 113, footnote), and adds that parts nearer the columella (modiolus) are spoken of as *inner*, parts nearer the external wall as *outer*. In the use, indeed, of such terms as *apex* and *cupola* the assumption in question is implied.

[541] *Tractus Spiralis Foraminulentus* (Fig. 1455, p. 935).—This is the spirally arranged series of foramina, the apertures of the *longitudinal canals of the modiolus*, transmitting the filaments of the cochlear nerve to the basal and middle whorls of the cochlea; in the centre of the spiral is a larger foramen (*foramen centrale cochleæ*), the aperture of the *central canal of the modiolus*, transmitting that part of the cochlear nerve which supplies the apical half-whorl of the cochlea. Strictly speaking, the application of the term *tractus spiralis foraminulentus* should be limited to the spiral groove in which the foramina are situate; the whole of the shallow depression which the spiral groove itself occupies, corresponding as it does to the centre of the base of the cochlea—that is, to the base of the modiolus—being by Toldt named *area cochleæ*, and by Quain *fossula* or *fovea cochleæ*. (See also notes [534] and [539] above.)

[542] *Osseous and Membranous Semicircular Canals* (Figs. 1456 to 1458, p. 936).—In the German official nomenclature the membranous semicircular canals are termed *ductus semicirculares*. This usage is at once concise, and avoids the possibility of confusion; but to speak in English of the *semicircular ducts* would be too much of an innovation, and I have therefore introduced the word *membranous* in parentheses in all cases in which the *membranous canals* are denoted. In all cases in which the term *semicircular canal* is used in this work without that qualification, one of the *osseous canals* is indicated.

[543] *Cristæ Acusticæ and *Ampullary Sulci* (Fig. 1456, p. 936).—"Each of the membranous ampullæ exhibits on its outer surface a groove traversing nearly half its circumference, known as the *sulcus ampullaris*, along which bundles of the auditory nerve enter the wall of the ampulla. This groove corresponds to a sickle-shaped fold in the interior of the ampulla, the *crista ampullaris*, covered by the sensory epithelium" (Von Langer and Toldt, *op. cit.*, p. 796). Quain calls the whole projection *septum transversum*, and its most prominent part, surmounted by the auditory epithelium, the *crista acustica*, and it is this latter name which is commonly used in England to denote the *crista ampullaris* of the German official nomenclature. "Beyond each rounded end of the crista," continues Quain (*op. cit.*, vol. iii., part iii., p. 108), "is a crescent-shaped edge (covered by columnar epithelium) which has been termed *septum semilunatum*." Neither this term nor the term *septum transversum* is used by Toldt; Quain, on the other hand, does not use the term *sulcus ampullaris* or any equivalent thereof. Macalister describes the sulcus without giving it any distinctive name. He writes (*op. cit.*, p. 685): "On the saccule and on each ampulla there are thickened areas circumscribed and projecting into their cavities; each ampulla is crossed by a transverse *crista acustica*, marked externally by a slight depression. The similar spots on the inner wall of the sacculus and utricle are called *maculæ acusticæ*." As the English equivalent of **sulcus ampullaris*, I use in the text a literal translation, **ampullary groove*. (See Fig. 1462, p. 938.)

[544] *The Vestibular Nerve* (Figs. 1457, 1458, p. 936).—Toldt's description and nomenclature of the superior division of the auditory nerve or vestibular nerve differ somewhat from those of Quain. "The *vestibular nerve* consists of two branches—an *upper*, *ramus utriculo-ampullaris*, and a *lower*, *ramus sacculo-ampullaris*. The *utriculo-ampullary nerve* consists of the united *utricular nerve*, *superior ampullary nerve*, *and external ampullary nerve*; the *sacculo-ampullary nerve* consists of the united *saccular nerve* and *posterior ampullary nerve*" (Von Langer and Toldt, *op. cit.*, pp. 788, 789). According to Quain, on the other hand, the *superior division of the auditory nerve*, or *vestibular nerve*, supplies only the *utricular nerve*, *superior ampullary nerve*, and *external ampullary nerve*—consists, that is, of the filaments that emerge from the *macula cribrosa superior* (see note [531] above)—and is thus really identical with the **utriculo-ampullary branch* of Toldt. The *inferior division of the auditory nerve*, on the other hand, divides into (*a*) a *posterior branch* (identical with Toldt's **sacculo-ampullary branch*) which supplies the *saccular nerve*, emerging from the *macula cribrosa media* (see note [532] above), and the *posterior ampullary nerve*, emerging from the *macula cribrosa inferior* (see note [533] above); and (*b*) an *anterior branch*, which is the *cochlear nerve*. Yet another classification of these branches is adopted by Macalister (*op. cit.*, p. 684), apparently based upon, and yet differing slightly from, that of Schwalbe. Quain's grouping of the branches would, however, seem to be that most in accordance with the anatomical data.

[545] **Vestibular Cæcum, and *Cupolar Cæcum or Lagena* (Fig. 1458, p. 936).—The name of **cæcum vestibulare* is given by Toldt to the blind extremity of the canal of the cochlea at the base of that organ, **cæcum cupulare* to the blind extremity at the apex. These terms are not used by Quain, who, however, speaks of the latter as the *lagena*.

[546] *Cavity of the Cochlea* (Ibid.).—The term here translated *cavity of the cochlea* is in the original German *Schneckenkanal*, a literal rendering of which as *cochlear canal* would be likely to lead to confusion. The *cavity* or *canal* here designated is the interior of the membranous cochlea considered as a whole, without regard to its interior subdivisions into *scala vestibuli*, *scala tympani*, and *ductus cochlearis*. Concerning the author's use of a similar term to denote the interior of the osseous cochlea considered as a whole, viz., the *spiral osseous canal of the cochlea*, see note [536] above.

[547] **Ductus Perilymphaticus* (Fig. 1459, p. 937).—This name is not used by Quain or Macalister. According to Von Langer and Toldt (*op. cit.*, p. 798), "The canaliculus cochleæ (aqueduct of the cochlea) conveys the *ductus perilymphaticus;* this leads downwards from the scala tympani quite close to the fenestra rotunda, and at the inferior (or posterior) border of the petrous portion of the temporal bone [see Fig. 133, p. 65, in Part I.], through the external orifice of the aqueduct of the cochlea [see Fig. 128, p. 62, and Fig. 129, p. 63, in Part I.], a communication is effected between the perilymphatic space and the subdural space." According to Quain (*op. cit.*, vol. iii., part iii., p. 104), "Close to the commencement of the scala tympani is the orifice of a small canal (*aqueductus cochleæ*), which extends downwards and inwards to the lower border of the petrous bone, where it opens into a depression immediately in front of the jugular fossa. It transmits a small vein which joins the inferior petrosal sinus. There is also a communication along the aqueductus cochleæ between the subarachnoid space and the perilymph in the scala tympani." The communication is rather, as described by Quain, of the nature of a perivascular lymph space (resembling those perivascular spaces in the tunica adventitia of the bloodvessels of the brain and the spinal cord which communicate with the subarachnoid space at the surface of those organs), than a distinct duct, as described by Von Langer and Toldt. On the other hand, since the vein of the aqueduct of the cochlea joins the inferior petrosal sinus, which runs between the layers of the dura mater, the perilymphatic space in question must join the *subdural space* (as stated by Von Langer and Toldt), and not the *subarachnoid space* (as stated by Quain). The latter author's error is, however, probably a mere clerical error. Macalister says merely (*op. cit.*, p. 684): "A fine opening starts from the beginning of the floor of the scala tympani and passes down to the side of the basilar surface of the petrous bone as the aqueductus cochleæ; veins and lymphatics traverse it."

[548] **Vestibular Nerve* (Fig. 1465, p. 939).—The term *nervus vestibuli* as used by Toldt is more comprehensive than the term *vestibular nerve* as used by Quain, embracing as it does, in addition to the *utricular nerve*, the *superior ampullary nerve* and the *external ampullary nerve* (which constitute the *vestibular nerve* or *superior division of the auditory nerve*, according to Quain), the *saccular nerve* and the *posterior ampullary nerve* (which latter are regarded by Quain as constituting a distinct *posterior branch of the inferior division of the auditory nerve*). See also note [544] above, and notes [5] and [6] to p. 937.

[549] *Spiral Prominence* (Fig. 1466, p. 939).—This is described by Quain, although the name *spiral prominence* is not actually employed by this author. He writes (*op. cit.*, vol. iii., part iii., p. 119): "There is usually a slight inward projection [on the outer wall of the cochlear canal] a little above the spiral ligament, containing a prominent bloodvessel." This "inward projection" is that named *prominentia spiralis* in Toldt's Fig. 1466, p. 939. The "prominent bloodvessel" is also visible in the same figure, but is left unnamed. Quain, in his Fig. 135 (*op. cit.*, *tom. cit.*, p. 118), names it the *vas prominens*, the name used by Toldt in Fig. 1468, p. 940.

[550] **Arterial Glomerulus of the Cochlea* (Ibid.).—"The offsets of the *cochlear branch* [*ramus cochleæ*, one of the two terminal branches of the internal auditory artery] enter the canaliculi of the modiolus, and form loops or actual glomeruli, the *glomeruli arteriosi cochleæ*, and from these latter arise the fine terminal branches to the spiral ganglion and to the nerve expansion in the osseous spiral lamina as well as to the wall of the scala vestibuli and to Reissner's membrane" (Von Langer and Toldt, *op cit.*, p. 799). Quain describes "a spirally arranged glomerulus-like arterial plexus" in the *outer* wall of the cochlea (*op. cit.*, vol. iii., part iii., p. 126), but makes no mention of glomeruli on the vessels in the canals of the modiolus and the osseous spiral lamina.

[551] *The Bloodvessels of the Labyrinth* (Figs. 1467, 1468, p. 940).—Quain's account of these vessels is not very minutely detailed, and for this reason many of the names used on this page are not to be found in Quain's "Anatomy." According to Von Langer and Toldt, whose account I here summarize (*vide op. cit.*, pp. 799, 800), the *internal auditory artery* (*arteria auditiva interna*), a branch of the *basilar artery* (*arteria basilaris*)—see Fig. 1007, p. 619, Fig. 1011, p. 622, and Fig. 1012, p. 623, in Part V.—accompanies the auditory nerve into the internal auditory meatus. After giving off a considerable *vestibular branch* (*ramus vestibularis*), which supplies the maculæ acusticæ of the saccule and utricle, and the ampullæ of the superior and external membranous semicircular canals, the *internal auditory artery* divides into its two terminal branches. One of these, the *cochlear branch* (*ramus cochleæ*), supplies the middle and apical whorls of the cochlea; the branches of this vessel are described in note [550] above. The other terminal branch, the *vestibulocochlear branch* (*ramus vestibulocochlearis*), supplies the basal whorl of the cochlea, the saccule and the utricle, and the ampulla of the posterior membranous semicircular canal. The branches to the ampullæ give off fine arterial twigs along the membranous semicircular canals. The *veins of the labyrinth*, *internal auditory veins* (*venæ auditivæ internæ*), combine for the most part to form two trunks. One of these, the *vein of the aqueduct of the vestibule* (*vena aqueductus vestibuli*), is formed by the coalescence of capillaries from the utricle and the semicircular canals, and terminates in the superior petrosal sinus. The other, the *vein of the aqueduct of the cochlea* (*vena canaliculi cochleæ*), receives the veins of the cochlea and small *vestibular veins* (*venæ vestibulares*), and terminates in the bulb of the internal jugular vein (see note [547] above, and also Appendix to Part V., note [121]). The principal radicle of the cochlear veins is the *spiral vein of the modiolus* (*vena spiralis modioli*), which runs in the axial wall of the scala tympani; the venules opening into this trunk surround the wall of the scala tympani, whereas the terminal branches of the arteries surround the wall of the scala vestibuli. In the internal auditory meatus is a companion vein (sometimes wanting) to the internal auditory artery; this vessel is more particularly distinguished as the *internal auditory vein* (*vena auditiva interna*). It empties itself into the inferior petrosal sinus, and represents a collateral channel for the cochlear veins. The fine anastomoses of the vessels of the labyrinth with the vessels of the tympanum are effected by means of the bloodvessels of the petrous portion of the temporal bone.

[552] *Vas Spirale* (Fig. 1468, p. 940).—This vessel, though figured in Toldt's Atlas, is omitted by Von Langer and Toldt from their description of the vessels of the labyrinth (see note [551]

above). Quain, however, writes (*op. cit.*, vol. iii., part iii., p. 117): "Small bloodvessels are found in the basilar membrane, as a rule extending only over its inner part. They are usually terminated by a rather large longitudinally running vessel, situated opposite the outer rods of Corti, and known as the *vas spirale*."

[553] *Cartilage of Jacobson* (Fig. 1471, p. 943).—In the specimen shown in Fig. 1471 this cartilage barely comes into contact with the vomer, the end of that bone being truncated, and thus the cartilage hardly seems to deserve its alternative names of *vomerine cartilage* or *cartilago vomeronasalis*. When the extremity of the vomer is pointed, however (a condition which the name of the bone implies to be normal), the point extends so far forward that a considerable part of the narrow cartilage of Jacobson lies between the vomer below and the cartilage of the septum above.

[554] **Eminence of Jacobson* (Fig. 1472, p. 943).—This term is a translation of the term *Jacobson'scher Wulst* used in the original German edition of this work. Macalister (*op. cit.*, p. 635) describes a slight oblique thickening on the anterior and inferior part of the nasal septum, at the anterior extremity of which is the orifice of a blind pouch, the rudiment of the organ of Jacobson. This thickening is the **eminence of Jacobson*, to which no distinctive name is given either by Macalister or by Quain.

[555] **Lateral Crest of the Septum* (Fig. 1475, p. 945).—This term is not used by Quain or Macalister. As Fig. 1475 shows, something more than the common deviation of the septum is denoted. Von Langer and Toldt write (*op. cit.*, p. 92): "Not infrequently we find on the wall of the septum of the nose, in the region of the vomer, a horizontal ridge, *crista lateralis septi*, projecting to one side or the other; or the vomer as a whole may be curved towards one side. In this manner the size of one side of the nasal cavity may be greatly restricted."

[556] *Cavernous Plexus of the Turbinals* (Fig. 1476, p. 945).—This name is not actually used either by Quain or by Macalister. Quain, however, describes the veins as forming "a dense plexus in the mucous membrane, those in the deeper parts of the membrane being especially large, and closely arranged, so as almost to approach the structure of cavernous tissue. This is most largely developed over the whole lower turbinal, the lower and hinder border of the middle turbinal, and the hinder end of the upper turbinal, as well as on the lower and hinder part of the septum" (*op. cit.*, vol. iii., part iii., p. 145); while Macalister speaks of "patches of vascular tissue simulating erectile tissue" (*op. cit.*, p. 635).

[557] *Meatus Supremus and Concha Suprema* (Ibid.). — "Above and behind the superior turbinal bone, the openings of the sphenoidal and spheno-ethmoidal cells form a depression, the *meatus supremus*, over which there is sometimes a small bony plate, the *concha suprema*" (Macalister, *op. cit.*, p. 231). In another place (p. 637) Macalister speaks of the meatus supremus as the *fourth meatus*. This, it will be noted, he describes as constant, the *concha suprema* only as a variety.

[558] *Meckel's Space* (Fig. 1478, p. 947).—The hollow in the dried skull, close to the apex of the petrous bone, on its anterior or upper surface, in which the Gasserian ganglion lies, is known as the *fossa of the Gasserian ganglion*, or *impressio trigemini* (see Fig. 130, p. 63, in Part I.). In the fresh skull this surface is, of course, covered with dura mater. Further, the outer edge of the tentorium cerebelli being attached to the superior border of the petrous bone and also to the posterior clinoid process, between these two attachments this portion of the dura mater "bridges over the impressio trigemini on the upper surface of the apex of the petrous bone, and thus closes in the space for the reception of the Gasserian ganglion. This space is the cavum Meckelii" (Von Langer and Toldt, *op. cit.*, p. 668).

[559] *Epidermis* (Fig. 1484, p. 950).—The *epidermis* is also known as the *scarf-skin* or *cuticle;* but the signification of the term *cuticle* is often restricted to the *stratum corneum* and *stratum lucidum*, which are thus grouped together in contradistinction to the *rete mucosum* or *Malpighian layer*. This latter is also subdivided into three layers (distinguishable only under a higher magnification than that of Fig. 1484); in their order from without inwards, these are named *stratum granulosum*, *stratum spinosum*, and *stratum columnare*.

[560] *Hair-Bulb and Hair-Knob* (Fig. 1489, p. 952).—Von Langer and Toldt distinguish between these structures in the following terms (*op. cit.*, p. 818): "*Growing hairs* end in a hollow bulbous enlargement, the *hair-bulb* (*bulbus pili*, *Haarzwiebel*), into the interior of which the hair-papilla projects, the substance of which is composed of closely packed and, as a rule, deeply pigmented cells. *Full-grown hairs*, on the contrary, terminate in a somewhat pointed *hair-knob* (*Haarkolben*), which, like the cortical substance of the shaft or stem of the hair, is entirely composed of spindle-shaped cortical cells." Quain speaks of the *bulbus pili* (*Haarzwiebel*) indifferently as *hair-bulb* and *hair-knob*, and of the *Haarkolben* as a *modified hair-bulb*. The term *hair-knob*, however, is a literal translation of *Haarkolben*.

[561] *Inner Root-Sheath* (Figs. 1489, 1491, p. 952).—In the middle portion of the hair-follicle the *inner root-sheath* itself consists of three distinct layers, which are left unnamed by Toldt in the original German edition of this work. As, however, they are well shown in Fig. 1491, I have indicated them in the text to that figure. These layers are: (1) An outer, fenestrated, non-nucleated layer of flattened cells, known as *Henle's layer;* (2) an intermediate layer of polygonal nucleated cells, often two or three rows deep (though consisting of a single row only in Fig. 1491), known as *Huxley's layer;* and (3) a layer of imbricated, downwardly projecting scales, interdigitating with the upwardly pointing scales of the cuticle proper of the hair, and known itself as the *cuticle of the root-sheath*. Near the mouth and also near the fundus of the follicle, Henle's layer and Huxley's layer are no longer separable, being represented by a single continuous layer of large polygonal nucleated cells. As a whole the inner root-sheath is continuous with the stratum corneum (see note [559] above).

[562] *Dermic Coat of the Hair-Follicle* (Ibid.).—As the epidermic coat of the follicle is continuous with and represents the epidermis of the cutaneous surface, so the dermic coat is continuous with and represents the corium. There are no concise and well-established names in English for the layers of this dermic coat, which in the text to Figs. 1489 and 1491 I have called *outer fibrous layer*, *inner fibrous layer*, and *hyaline layer*, respectively, these terms being literal translations of the German names used by the author in the original. Macalister describes these layers in the following words (*op. cit.*, p. 94): "(1) A condensed layer of the stratum reticulare of the cutis, with longitudinal fibres and connective cells, lying upon (2) a modified extension of the papillary layer, with transverse, flattened connective cells and a few unstriped fibres; (3) a homogeneous basement membrane internally." Quain describes the first and second layers in similar terms, and of the third layer he writes (*op. cit.*, vol iii., part iii., p. 422): "The most internal layer (*hyaline layer*, Kölliker) is a transparent homogeneous membrane, marked transversely on its inner surface with some raised lines, and not reaching so high as

the mouth of the follicle; it corresponds with the membrana propria or basement membrane of allied structures." The looser connective tissue of the *outer fibrous layer*, the *circular fibres* of the *inner fibrous layer*, and the thin, structureless *hyaline layer*, are well shown in Fig. 1491. Next within the last-named is the broad *outer root-sheath*, consisting of several layers of polygonal cells (this corresponds with the Malpighian layer of the general surface of the skin), and then the trilaminar *inner root-sheath*, fully described in the last note. Finally we reach the *cortical* and then the *medullary substance* of the hair proper. (The *hair-cuticle* is not shown either in this figure or in any of the others.)

[563] **Retinacula of the Skin* (Fig. 1493, p. 953).—"Clearly defined and firm connexions between the skin and subjacent structures also exist in the form of the so-called *retinacula cutis*; these are tense bands of connective tissue, which are usually attached to bony prominences, radiating thence to determinate areas of skin" (Von Langer and Toldt, *op. cit.*, p. 822). In this instance the **retinacula* pass from the *epicranial* or *occipitofrontal aponeurosis* (*galea aponeurotica*) to the skin covering that membrane. In English works on anatomy the intimate connexion between these two layers of the scalp is always described. Ellis, for instance, writes (*op. cit.*, pp. 2, 3): "Superficial to the aponeurosis are the vessels and nerves of the scalp and a small quantity of fat, which is traversed by numerous short fibrous bands uniting it closely to the skin." But neither this author, nor Quain, nor Macalister, denotes these fibrous bands by the name **retinacula cutis*.

[564] *Lines of Cleavage of the Skin* (Figs. 1496, 1497, p. 954).—The subject of the "cleavage" (*Spaltbarkeit*) of the skin, which has important practical bearings on both dermatology and surgery, was first investigated by C. Langer and S. Swerchesky, and was discussed at considerable length by O. Simon. A short account of the matter is to be found in Von Langer and Toldt's "Anatomie," 7th ed., pp. 824, 825; and the subject is also alluded to briefly by Crocker ("Diseases of the Skin," 1888, p. 13 *et seq.*), who gives a list of authorities.

[565] *Hair-Streams and Hair-Whorls* (Figs. 1498, 1499, p. 955).—"Since the hair-follicles are inserted obliquely into the skin, the shafts or stems of the hairs are disposed in layers, and in those areas in which they are arranged in rows they form *hair-streams*, *flumina pilorum*. Where, on the other hand, the roots of the hairs approximate as they recede from the surface, *hair-whorls*, *vortices pilorum*, are formed, as on the vertex cranii. Such a whorl is also occasionally met with over the coccyx, the *coccygeal whorl*, *vortex coccygeus*" (Von Langer and Toldt, *op. cit.*, p. 826).

[566] *Vallum Unguis* (Figs. 1502, 1503, 1505, p. 956).—This name (*Nagelwall* in the vernacular) is given in Germany to the fold of skin surrounding and overlapping the nail and forming the outer boundary of the marginal groove of the nail-bed (*sulcus matricis unguis*). Macalister, however, distinguishes between the portion of the *vallum* overlapping the root or concealed margin of the nail and the portions overlapping the lateral margins of the nail, terming the former *nail-fold* and the latter *nail-walls* (*op. cit.*, p. 277).

[567] *Epidermic Portion of the Nail, or Nail proper* (Figs. 1504, 1505, p. 956).—In Fig. 1504 Toldt describes this as the *stratum corneum*, and Quain (*op. cit.*, *tom. cit.*, p. 419) also says that this part of the nail "corresponds in nature with the horny layer." According to Macalister, however (*op. cit.*, p. 277), this part of the nail "represents an enormously developed *stratum lucidum*, over the base of which is a soft fold, the partially developed *stratum corneum*, or *eponychium*." See also note [559] above.

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NEUROLOGY

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INDEX

TO THE NEUROLOGY AND TO THE ORGANS OF THE SENSES

Certain names in this Index have an asterisk (*) prefixed; these, as more fully explained in the Translator's Preface being terms that form part of the English nomenclature used in this work, but which are not commonly employed by English anatomists. To other names a dagger (†) is prefixed; these are Latin names used by the author in the original work, but not included in the official nomenclature of the "Anatomische Gesellschaft." Abbreviation: App. = Appendix.

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